SPECIAL GOLDEN ISSUE

CRASH

ZX SPECTRUM

A NEWSFIELD PUBLICATION
MARCH 1988
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At last – a cheap Spectrum clone See 16-page Tech Niche inside

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Garfield **– The Edge's cat licence**

Northstar **– space odyssey from Gremlin**

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1 SABOTEUR

Enter warehouse. Avoid dogs, guards, and ceiling-mounted anti-personnel weapons which are guided by video cameras. Cross to other side of the warehouse. You may have to use some computer terminals to unlock doors (not at skill level 1 though). Go down sewers. On your journey you should try to find a hidden time-bomb and carry it to the underground computer centre. Use two mini-trains which connect sewers to computer centre. Take (or swap time-bomb with) the disk, then escape by helicopter which is in the roof of the warehouse, (you'll have to climb the stanchions and jump across the gantries on the top floor - don't be frightened of jumping-off a screen.)

2 SABOTEUR II

You take the role of the Ninja's beautiful sister, who must avenge her fatally wounded brother. In "SABOTEUR I" he broke into the central security building and stole a computer disk that contained names of the rebel leaders. This disk also held information about the dictator's huge missile silo. Your night-time mission is to hand-glide into this high security complex of buidings and underground passages (over 700 screens), search for the pieces of punched computer tape that control the missile's flight path, redirect it before blast-off, then escape by motorbike down the one and only exit tunnel. The site is guarded at night by massive android guards with flame-throwers, vampire bats, and deadly black pumas.

3 SIGMA 7

Take-off from your base and fly to the next factory fighting your way through the space-mine defences as you go. The distance between the space stations and the number of space-mines increases with each new stage. Bonus points are awarded for destroying complete waves of mines. Once into the factory area, the player must move around clearing the pathways. Defence robo-mines rapidly home-in to kill simply by making contact, though they may be shot first. As the paths are cleared a pattern of fixed markers is revealed. This pattern MUST BE MEMORISED and subsequently entered on the control unit. Score is awarded for destroying robo-mines, and the points are shown over the explosions. Bonus points are awarded in proportion to the area of pathway cleared. If the time limit is exceeded (ie: the counter at the top left of the screen reads zero) then all remaining "lives" are lost and the game ends.

4 CRITICAL MASS

Keep flying towards the right of your screen. Avoid all rocks and mines. Watch out for incoming aliens and shoot to kill, but don't waste energy. If your craft gets destroyed, then use your jet-pack and follow the pointer at the bottom of the screen till you find a new ship in a replacement pod (just land on the small round pad next to it). When you come to the wall move up the screen, wait for and then shoot the robot guard, then keep moving (to avoid the guided plasma bolts) and shoot the turret in the middle of the two force gates, then move through quickly. When you get to the anti-matter converter fly in reverse (this gives you retro-thrust) then spin around and shoot the prism-shaped energy concentrator just as it is taking-in energy, before you get sucked-in and vapourised.

5 AIRWOLF

As Stringfellow Hawke, a former Vietnam chopper pilot, and the only man in the free world trained to fly the billion-dollar helicopter 'AIRWOLF' you have been assigned a dangerous rescue mission by the FIRM. Five important U.S. scientists are being held hostage deep in a subterranean base beneath the scorching Arizona desert. As Hawke, you must guide AIRWOLF using full stealth capabilities, on a series of perilous night-time missions and bring about the release of each scientist in turn. Only destruction of the defence control boxes strategically positioned within the cavern will allow AIRWOLF to descend to the heart of the base where the scientists are held.

6 DEEP STRIKE

You are in control of a World War I fighter. Your job is to protect and guide a flight of four bombers to take out an enemy fuel dump and barracks. You may then land and refuel before heading out once again. Keep your compass pointer vertical or you will run into heavy flak and also run out of fuel. Shoot down all planes EXCEPT for your own bomber which will fly dead ahead of you. Avoid barrage balloons. If one of your bombers gets hit a replacement will fly in after a few seconds. Bomb anything you like. If you can stay on course and survive long enough you should eventually pass over the enemy fuel dumps which you must wipe out.

7 COMBAT LYNX

You will have four bases which you must support with troops and air cover. Base 1 has an endless supply of fuel and weapons, and the ability to instantly revitalise injured troops brought back from the other bases. All the bases start with 30 fully equipped soldiers. Allied land vehicles move around the battlefield independently of your control. You provide the only allied air support. Enemy land vehicles will slowly converge on your bases unless stopped by the allied land vehicles, by mines that you have dropped, or by the other weapons of your COMBAT LYNX helicopter.

8 TURBO ESPRIT

An armoured supply car is carrying drugs to the centre of the city. One after the other, four delivery cars will drive in to meet it, and then drive off to their hide-aways. After the fourth pick-up the armoured supply car will leave the city. Your mission is to stop the delivery cars after they have made their pick-ups and before they disappear in their hide-aways, and to stop the armoured supply car after it has passed its drugs to the last car and before it leaves the city. You will score extra points for catching the drug smugglers alive, rather than shooting them. Your vehicle will be a Lotus Turbo Esprit capable of driving at 150 mph.

9 THANATOS

Fly till you get to a castle, then land and walk up to castle gate. Use flame from close range to burn down the gate. If you run out of flame, go back and find a witch tied between two stakes and eat her. Watch out for the knight on horseback who will try to lance you unless you first knock him off his horse with your claws. Eating the witch will refill your energy. In the first castle land near the girl and allow her to climb onto your back. Fly onto the next castle. When you find the book of spells, land and let the girl collect them. Fly to the last castle where you will find the cauldron in which the girl can cast her spell. Land nearby.

10 BOMBJACK II

Watch Out! Jack's back! Our superhero Bombjack is here again in comic caper of the tactical kind! This time, armed and deadly - ready for combat. Use the stab key to fight your way through the reptile infested lava pit and on into outer-space. Have you got what it takes? Have you got the mental agility to outwit the enemies and collect the treasure in over 40 fiendishly complicated settings? Collect them in the right order and get a bonus Jack.

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CRASH

ZX SPECTRUM

ISSUE 50 MARCH 1988

NUMBER 50

FEATURES

REGULARS

DO IT YOURSELF

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NEWSFIELD
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COVER BY **Oliver Frey**



When it happened, of course, there was none of the shouting, none of the panic, none of the breaking of windows or looting or even the soft despair of mortality as the world rolled to its dead end. Some things stopped: there was no more bingo in the suddenly tasteful Sun, there were few arrests, there were no tourists in Washington.

But Washington was a perfect microcosm of the world it had created, now so close to destruction by the maturation of its own technology. And on this bright Sunday, Capitol Hill shone scrubbed in its untarnished power as the President brought together his roles – family man, leader of men; commander-in-chief, accepter of defeat – in the final broadcast.

'Final'? No-one there would have thought of it as final; perhaps there was more slovenliness than usual in the CBS crew, perhaps the old President's own face was showing fewer than normal of the smile lines he had so often paraded on the hustings beside his perfect life.

Yet the Potomac rolled undisturbed and there was still the odd protester bothering to pace outside the White House; all crises were equal in PR terms.

The President began, conscious for the first time of his own corniness. 'My fellow Americans' – he wondered how many were out there, at the end of cables and aerials, how many were really honest Iowa farm stock with a kitchen radio and how many were Wall Street slickers with five screens running at once – 'you know as much as I do about the coming days which face our country' – who had written this?

Ingham – it was Ingham who wrote it, grey Ingham, once the keen Washington journalist fantasising his own Watergate, now a sour and doubtful aide – Ingham, tapping on the President's shoulder now.

The CBS men woke up. Outside there was an aeroplane and a bird: symbols of this watershed the cameraman would never touch.

Ingham was still tapping on the President's shoulder when he started reading the telex, and he had to jerk irritably away, cursing the cameras as he did so.

Then the old actor's sense took over. 'Yes, in hours we will meet the greatest trial we have faced since our nation's birth. But now there is good news.' A pause – melodramatise? Or speak strongly, go straight ahead?

Go straight ahead. 'The next issue of CRASH will be on sale March 31.'

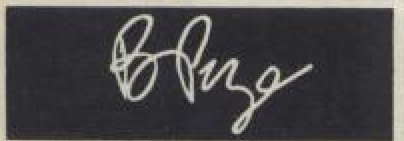

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BEAT THE SYSTEM . . . Now for the crew of FIREFLY there is no home – just a desperate mission to eliminate the mechanoid army which has colonised the solar system.

CRASH

ZX SPECTRUM

NUMBER 50





THE STATE OF THE INDUSTRY

. . . and what a state it's in!

There's this cynical tradition at CRASH that when the editor can't think what to write in his editorial on the last day before printing he'll put down some meaningless 'state of the industry' musings. These usually turn on the observation that tie-ins and coin-op licences are growing ever more important.

Well, tie-ins and coin-op licences have been growing ever more important since the world was without form and void, because now the software houses can afford to buy licences – and the film producers, TV stations, Garfield grandees and so on are more aware of the marketing possibilities of computer games. Gradual movement into the mainstream of home entertainment . . . industry coming of age . . . 16-bit revolution . . . yawn.

You've heard it all before. But then there are only 4,000,000 of you – Spectrum-owners, that is. And it's a different kind of licence we should be thinking about: the TV licence. There are only some 20,000,000 of those in the land, yet look at the attention TV gets – in the national press every day, in the public eye every evening. Why shouldn't the home computer get that kind of coverage? Why shouldn't cycling simulators get as much coverage as cycling, a minority spectator sport?

No national newspaper runs regular home-computer features; when they do discuss home computers, it's usually in stories of the absurd 'automated house of the future' strain that resurfaced in the *Daily Mail* today (February 10). (And it's usually headlined CHIPS WITH EVERYTHING.)

Or it's about *Jack The Ripper* (because it's 18-rated) or *Tetris* (because it's Russian – hey, guys, it's that crazy crazy *glasnost*!).

Like it or not, computer games – and the dear old ever-so-British and unfashionably cheap Spectrum – still have a train-spotting image. Only the macho coin-ops pass street-cred's muster.

Organisations such as the British Micro Federation and the Guild Of Software Houses haven't done much. We can preen and chatter and call our interest – whether it's a commercial or hobby interest – 'leisure software' instead of 'computer games' all we like, but only wider awareness of the games themselves will do the trick. And perhaps a shorter, catchier moniker than 'home computer' would help!

Perhaps SAM, the cheap new Spectrum-type computer discovered by CRASH and previewed on page 58, will help too; perhaps there'll be as many monitors as TV sets one day. But till then, why not write to your favourite newspaper and ask it to cover computer games?

IN THE NEXT CRASH

- **ATEI SHOW REPORT** – the 44th top arcade exhibition
- **RUN IT AGAIN** – isometric games in depth (and height and breadth)
- **PBM CONVENTION REPORT** – new games and news
- **WIN A DAY OUT AT LAND ROVER** – thanks to Elite
- **ON THE SCREEN** – pixelated pictures
- **THE CRASHTIONNAIRE** – we ask the questions
- **CRASH READERS' AWARDS RESULTS** – you've got the answers
- **AND PAGES AND PAGES OF TIPS AND REVIEWS**

REVIEWS

March's high-fliers

SMASHED!

HOT SHOTS 75% and over . . .

FULL INDEX

ADVERTISEMENT INDEX

FAVOURITES BACK AS BUDGETS

MASTERTRONIC has obtained budget rerelease rights to all Activision's products, and has started issuing them at £1.99 and £2.99. Titles already out include *Ghostbusters* (60% Overall in CRASH Issue 13), *The Eidolon* (76%/36), and *Ballblazer* (71%/28), all on the Ricochet label. Other Ricochet rereleases include Electric Dreams's *Aliens* (84%/37), Ocean's *Transformers* (60%/27) and Virgin Games's Smashed *Dan Dare* (92%/32), and on the Mastertronic label comes Gremlin Graphics's *Trailblazer* (88%/34).

In a separate deal, Hewson's £2.99 budget label **Rack It** is releasing old Gargoyle Games titles such as *Tir Na Nog* (92%/11), *Sweevo's World* (95%/25) and *Heavy On The Magick* (9 out of 10 in Issue 29).

Hewson also plans a Smashing +3 disk compilation of *Tir Na Nog*, the highly-regarded *Dun Darach* (97%/18) and (95%/22) *Marsport*.



► Oceans of experience: Special FX has signed a deal with Ocean to handle the business side of its releases, and this month's Smash *Firefly* is the first under that arrangement. It follows a fling with Software Projects, which published Special FX's *Hysteria*.

And the Liverpool-based development house's boss Paul Finnegan (top right) and *Firefly* programmer Jonathan Smith (bottom right) are both ex-Ocean men.

Smith's previous Ocean/Imagine credits include *Green Beret* and Smashes *Cobra* and *Hypersports*, and ex-Ocean programmer Tony Pomfrit (*Rambo*, *Daley Thompson's Decathlon*) is also working with the new team – whose future projects for Ocean include the *Robocop* film licence.

Firefly *Smash* .... *page 12*

NEW NAME, HALL FOR *PCW* SHOW

THE *PCW* Show has abandoned London's Olympia exhibition hall – and opted for a name-change too.

Now known as **The Personal Computer Show**, Britain's top exhibition for software and hardware will be based at Earls Court, London's biggest exhibition centre. Earls Court is bigger than Olympia – 23000 square metres rather than 18000 square metres.

And the extra room's essential. Organisers of the 11th annual show this September hope to see more than 90,000 visitors, some 10,000 up on 1987.

The new-look show will have a completely separate hall for games and home computing, whereas at Olympia The *PCW* Show had some business-type stands (such as Amstrad) in the leisure area.

Despite the name-change, *Personal Computer World* magazine continues to 'present' the show.

This year's Personal Computer Show will be held at Earls Court from September 14-18.

The **Home Entertainment Dealer Show** starts this year at Birmingham's National Exhibition Centre and will be held August 16-18, not the May days originally announced.
DS, mainly for the video industry, will probably include a viewing theatre for the public.

TWO DOWN

TWO software houses are withdrawing from the British market.

Nexus went into liquidation in January with debts believed to be as high as £200,000, just months after signing an 'affiliated label' distribution deal with Electronic Arts.

And West German-owned **Ariolasoft** will close its UK operation at the end of March, probably selling its software titles to a British house before then. The move followed Ariolasoft's disappointing sales last autumn.

DOUBLE TROUBLE FOR TELECOMSOFT

FIREBIRD flew through a legal battle when a court gave it the go-ahead to publish *Morpheus* and *Magnetron* – but a new argument is developing between sister label **Rainbird** and adventure programmers **Level 9**.

In the court case, Hewson had claimed *it* should release the two titles programmed by the Graftgold team – and took Firebird to court after the Telecomsoft label signed a contract with Graftgold. Hewson believed its earlier arrangement with Graftgold gave it rights to the two disputed games.

But the case ended with Firebird getting *Morpheus* and *Magnetron* – which will be the first products of Graftgold's long-term exclusive contract with Firebird.

The Level 9 dispute follows a sudden severing of Rainbird's relationship with the programmers of *Knight Orc* (interviewed in the last CRASH).

They'd signed a four-game contract with Rainbird in April 1986, but Telecomsoft says Level 9 was always late with finished games – and after the break-up the programmers moved to a new label, **Mandarin**, which will release their next game *Time & Magik*.

CODE MASTERS SAVES THE WORLD

CODE MASTERS plans to help the world famine-aid charity Sport Aid – by writing a special game based on the sports extravaganza and donating all proceeds to it.

The game will probably be based on Sport Aid's sponsored 'race against time' run. Before the mass race an athlete runs through several cities carrying a torch, and the game will likely follow that star runner.

An April release is expected.

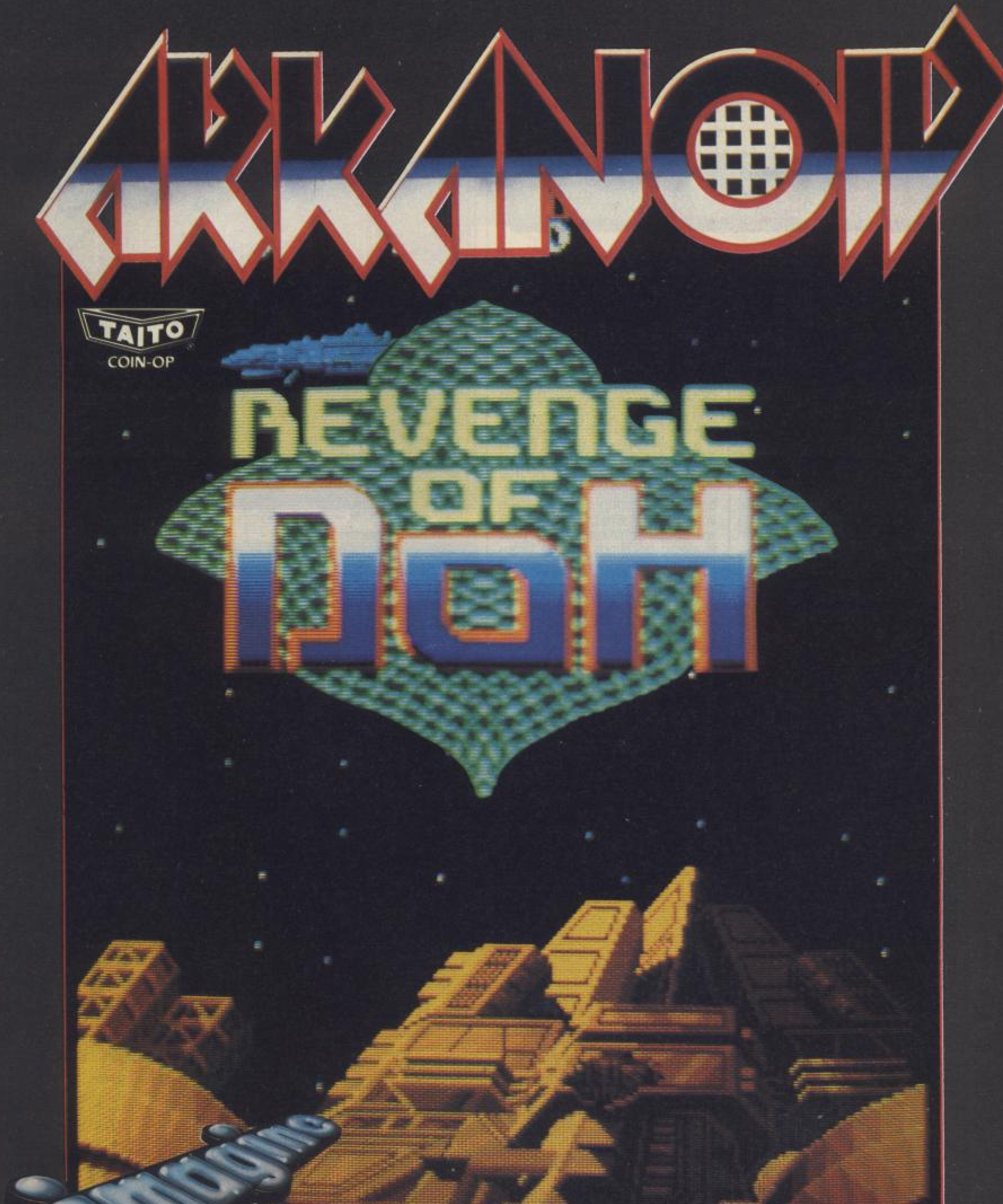


MELBOURNE'S COIN-OP COUP

THE 'most-played arcade game of 1987' will be Melbourne House's first release under a massive new coin-op licensing deal, according to the Mastertronic full-price label.

Melbourne House will release *Double Dragon* to celebrate its exclusive worldwide home-computer rights to all Technos arcade games. Future Technos products are covered by the arrangement, as well as current arcade successes – Melbourne House says it's the first time a major Japanese coin-op company has assigned computer rights to future coin-ops.

The agreement follows a £2 million rights deal by **GO!**, US Gold's sister label, which will release about ten conversions of Capcom coin-ops in the next year. The first will be a follow-up to *1942* (the computer game was from Elite) – called *1943*.



ARKANOID
TAITO
COIN-OP
REVENGE OF DOH
imagine
...the name of the game

TETRIS

Producer: **Mirrorsoft**
Retail price: **£7.99 cassette, £12.99 disk**
Authors: **Vagin Gerasimov and Alexi Paszitnov**

Take the the simple idea that you can completely fill a rectangle with other right-angled shapes, mix in two Russian programmers, and not only do you have the first Russian-designed computer game to be commercially available in the West, but also something that ought to be child's play . . . yet isn't.

BYM

" You may not expect much action from a strategic game like this but Tetris **has its moments of panic. And you may expect that every game will be just like the last – so prepare to be amazed again. The random selection of shapes ensures that no two games will be the same. This looks destined to be one of the best thinking games yet – and a never-ending source of fun and frustration for thinking players. "**

85%

In *Tetris*, launched at the *Which? Computer* Show in January, blocks of different shapes drop from the top of the screen into a box. Each block is made up of four small squares arranged to make a larger square, an L shape or a column.

As the blocks fall they can be rotated or moved horizontally so that every space in the box is filled. Ten small squares make up one horizontal line in the box. When a line is completely without empty spaces, it scrolls down so that the process can be repeated. But if a line remains incomplete, another line must be finished above it before the screen scrolls down.

The more lines that stand incomplete, the higher the blocks above them stack, reducing the space in which falling shapes can be manipulated. Eventually the blocks reach the top of the screen and the game, which theoretically can continue forever, is over.

A statistic box at the left of the screen shows the number of shapes of different colours that have been positioned, and another box at the bottom right of the screen shows what shape of block will appear onscreen next. Thus strategic decisions can be taken on how to place the blocks leaving no gaps.

There are ten skill levels; the higher the level, the faster the blocks fall and hence the less time for planning (individual pieces can be speeded up anytime, so if you've decided where to place a block you don't have to wait for it!).

And the more successful you are in completing lines, the faster the blocks fall. You can never 'win' *Tetris*; players can hone their skills for months and still have new challenges to meet, brought to them by a Moscow software team which shows star programmers are the same everywhere.

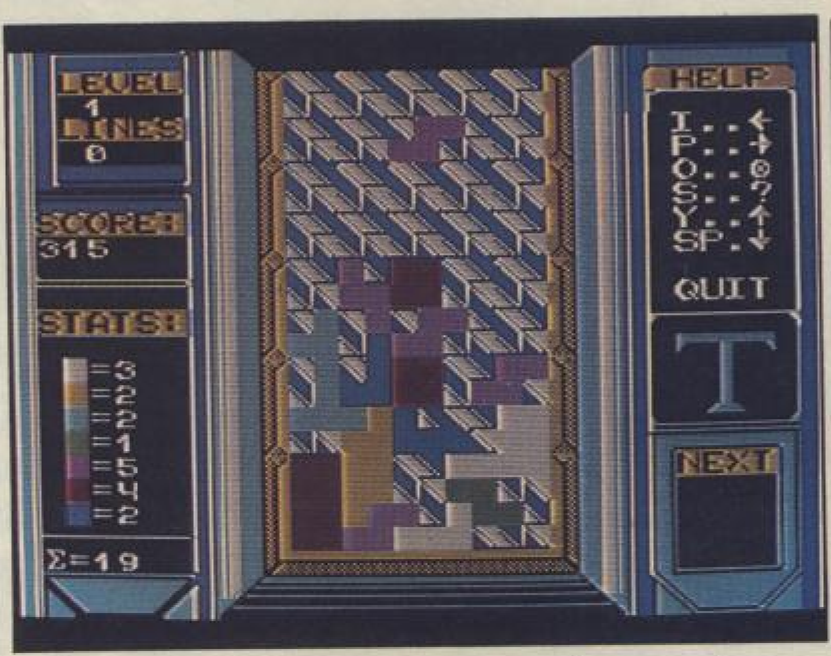
Tetris programmer Vagin Gerasimov is an 18-year-old student at Moscow University, a sort of Red Square Code Master – so perhaps he'll produce more of the Russian games which Mirrorsoft hopes to bring to Britain.

DAVE

" Tetris **is the simplest game to understand around. but the gameplay is very tricky. It seems an easy idea: build a straight line across the bottom of the screen. But as always there's a snag!**

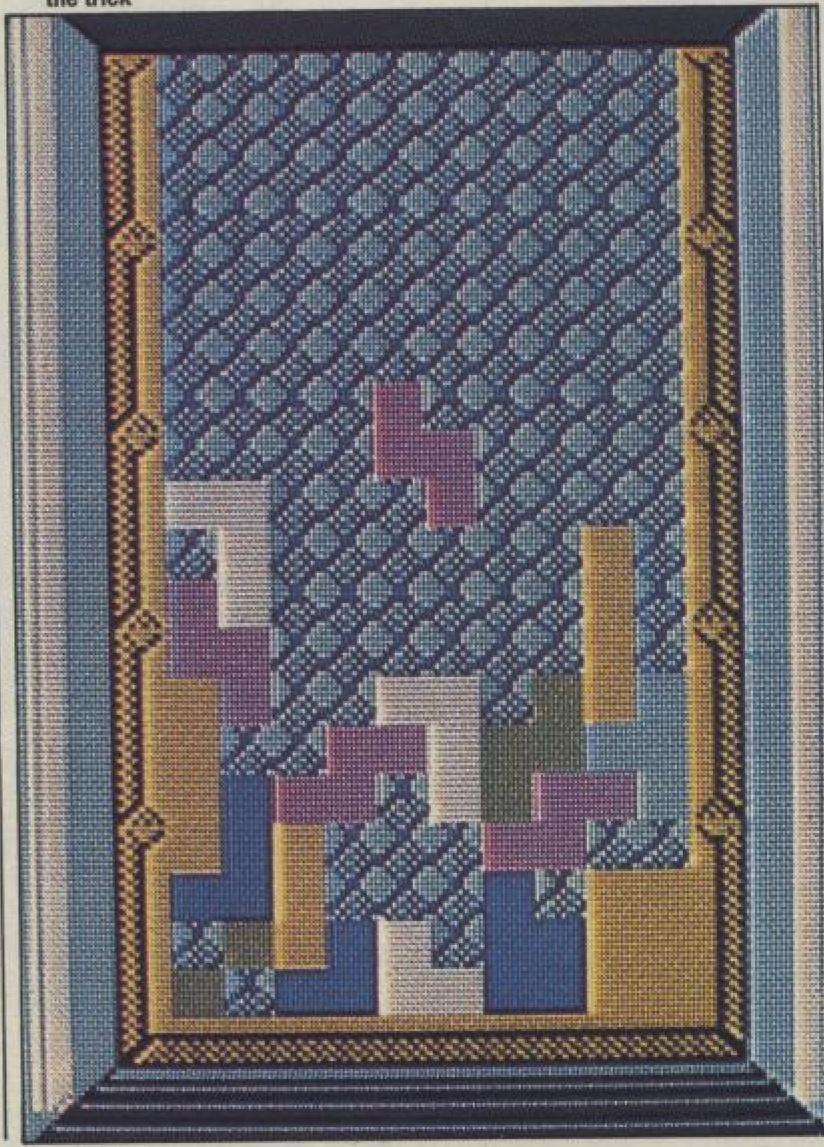
And there's a snag with the game too. The attraction of Tetris **is its simplicity, but that becomes boring after a bit – there's not as much skill involved as you'd expect. "**

73%



► **'Fiendishly addictive but poorly implemented':** *Tetris*

► **Hmmm . . . some *glasnost* in those lines, but a little *perestroika* should do the trick**



MIKE

" Tetris **is an odd game. The Commodore 64 version was widely renowned for its addictiveness, but on the Spectrum that's strangely missing.**

And I was stunned by how much a simple keyboard problem mars the game. O rather than SPACE is used to turn the falling shapes, but my arcade instincts tell me to press the fire button – leading to some annoyed screams when the piece that's been awaited for many a long hour slides into the wrong place!

The coloured-background option is pretty useless, and the tune is more a good piece of programming than a good piece of listening. So generally Tetris **is a disappointment; yes, it's a jolly fun game, but it could have been astoundingly good on the Spectrum and isn't. "**

73%

COMMENTS

Joysticks: Kempston
Graphics: simple foreground with great use of colour; eye-straining optional patterned backgrounds
Sound: the continuous tune is cleverly used but not very good; at least it can be swapped for informative spot effects
Options: sound and patterned backgrounds on/off
General rating: a fiendishly addictive game, poorly implemented for the Spectrum but still appealing

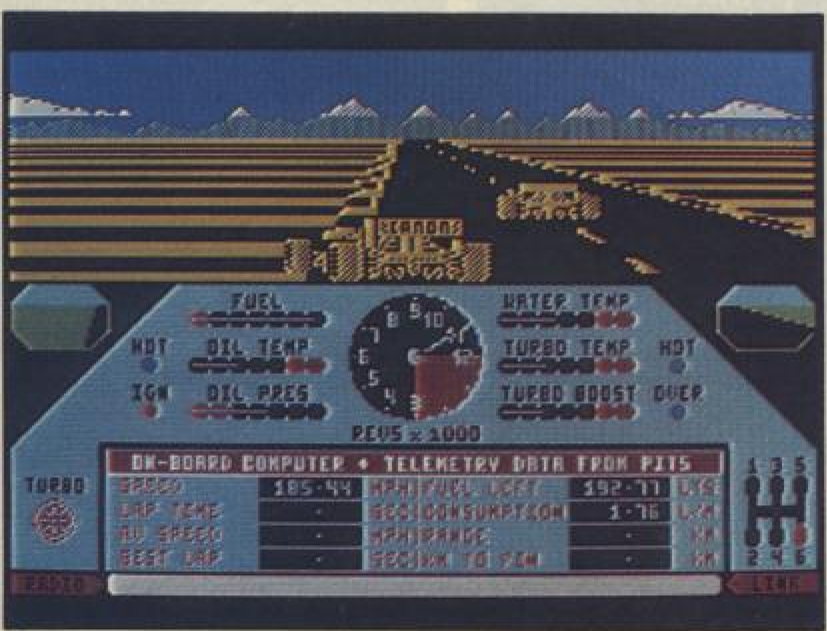
Presentation	79%
Graphics	67%
Playability	79%
Addictive qualities	79%
OVERALL	**77%**

NIGEL MANSELL'S GRAND PRIX

Producer: **Martech**
Retail price: **£9.99**
Author: **Dave Looker**

You may get the girls and pots of money, but danger and death stand grinning by your shoulder in the fast world of Formula One racing. And to keep them at arm's length practice must follow practice till the Williams car you drive is under perfect control.

A careful, dangerous balance must be struck between racing the car as fast as possible and yet not overstraining it – mechanical problems can lose you a race or your life.



▶ **More Prix than kicks**

For instance, steering the correct racing line through corners helps reduce your lap time – but if a mistake is made and you leave the black tarmac, vital time is lost and your car could even spin.

Combine late braking into bends and speedy acceleration away from them with the accurate steering that you need to overtake, block and corner, and you have all the makings of a champion driver (real-life Formula One champion Nigel Mansell and the manufacturers of his Williams car worked on Martech's game).

But of course you're not the only one on the track. Other cars can be awkward obstacles if they too are taking the correct line, and you must protect your position by not letting them pass you. To help you, wing mirrors at both sides of the screen show the traffic to the rear.

One of the most important instruments on a racing car is the rev counter, which helps you keep the engine at optimum power – ideally you should stay between 9000 and 12000 revs. Try less than that, and insufficient speed is generated; go beyond the upper level, and the engine can be damaged and much valuable fuel consumed.

To keep the engine revs within the power band you must change gear at just the right moment – and the Williams can go through six finely-graded gears.

Below the main screen is a console giving you vital facts about your car and its state of health. A turbo-boost indicator shows the additional boost applied to the engine – by engaging boost tremendous extra power can be called up for daring overtaking manoeuvres and to gain vital time on your opponents.

BYM

" Nigel Mansell's Grand Prix **has the decency to use the whole width of the screen for the track, the loss of simulated hills is no real loss, wing mirrors are a useful innovation, and the scrolling is kinda smooth. But it's the sound that really draws your attention to this game – and to the 128K version especially.** "

79%

Fuel levels, oil temperature and pressure, and water and turbo temperature are also monitored and must remain within safe parameters.

Another onboard display keeps track of your racing performance, giving your current speed, your lap time, your average speed for the lap and your best lap time, the fuel level, the current rate of fuel consumption and the mileage left at that rate.

If the worst happens and your car breaks down, or crashes, a message window displays the reason for the failure – or simply informs you that your car is too badly damaged to continue.

Each Grand Prix race is preceded by a practice session: one warm-up lap and three qualifying laps. The faster your qualifying-lap time, the better the position you have on the starting grid. But if you fail to complete the qualifying laps in time, more practice is necessary before you can join Nelson Piquet and Ayrton Senna on the grid.

After qualifying you go through a stomach-churning wait while the last few seconds tick away, surrounded by noise and the smell of burning rubber – and then the green light shines and you're away with tons of hurtling machinery.

Use the instruments well and make pit stops for fresh tyres; the new rubber can stop you slipping or even going off the track. Tyres are changed automatically when you enter the pit stop, and you can make as many stops as you like – but think carefully, balancing the benefits against the lost time of each.

Each Grand Prix season has 16 races on different tracks (a half-finished season can be saved to tape or disk). And you can drive each race for five, ten or 20 laps or a full-length Grand Prix distance – the choice is made at the beginning of the game and then fixed.

Points are awarded for finishing in one of the first six positions, and accumulate over the season to determine the champion of this hard, fast sport.

▶ **Close on the tail of a Grand Prix contestant**



MIKE

" **This is undoubtedly the best race simulator (as opposed to** Enduro Racer-**style race game) on the market today, so it's highly recommended to those who want a simulation.**

But though it's satisfactory playable, nonspecialists might find the demands of accuracy and concentration wear thin and that there's little long-term addictiveness in Nigel Mansell's Grand Prix. "

73%

PAUL

" **I was heartily disappointed by** Nigel Mansell's Grand Prix. **Supposedly it was ten months in development – but I can't say it shows!**

Graphics aside – the best place for them – the game shows some promise, but basically it's a very cheap clone of Firebird's Commodore 64 hit Revs.

Cornering, the most important part of any race game, feels very realistic but the graphical representation of it is very poor and ruins the atmosphere.

And though the race starts off very competitively with cars swarming around, once they've disappeared into the distance (which often happens) the addictiveness goes right out the exhaust pipe. Oh well, back to Full Throttle, **I suppose . . .** "

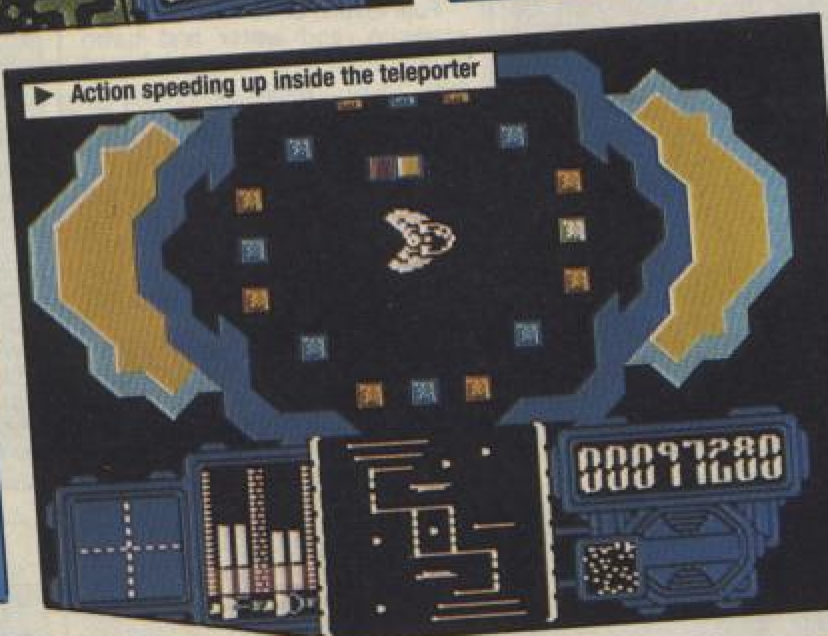
63%

COMMENTS

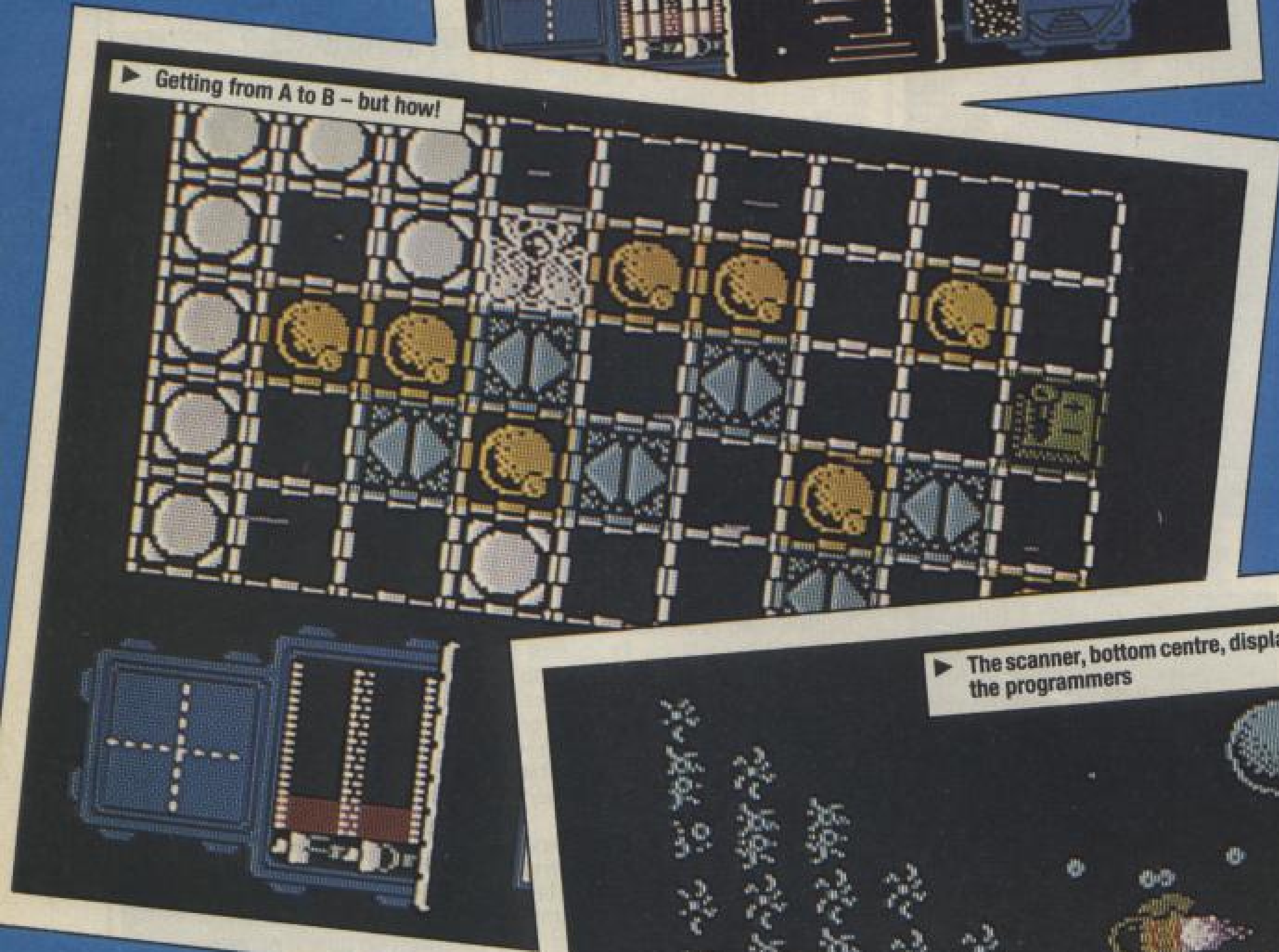
Joysticks: none
Graphics: all the cars and the scenery are the same colour, so it's soon a race against eyestrain – and the stripy grass doesn't help
Sound: no tunes, excellent 128K revving and running noises, simple 48K effects
Options: practice or race for real; 16 different tracks; choose number of laps on each
General rating: *Nigel Mansell's Grand Prix* isn't fast and furious enough to be a great race game, but with perseverance it becomes a mildly addictive simulation

Presentation	76%
Graphics	72%
Playability	70%
Addictive qualities	76%
OVERALL	**72%**

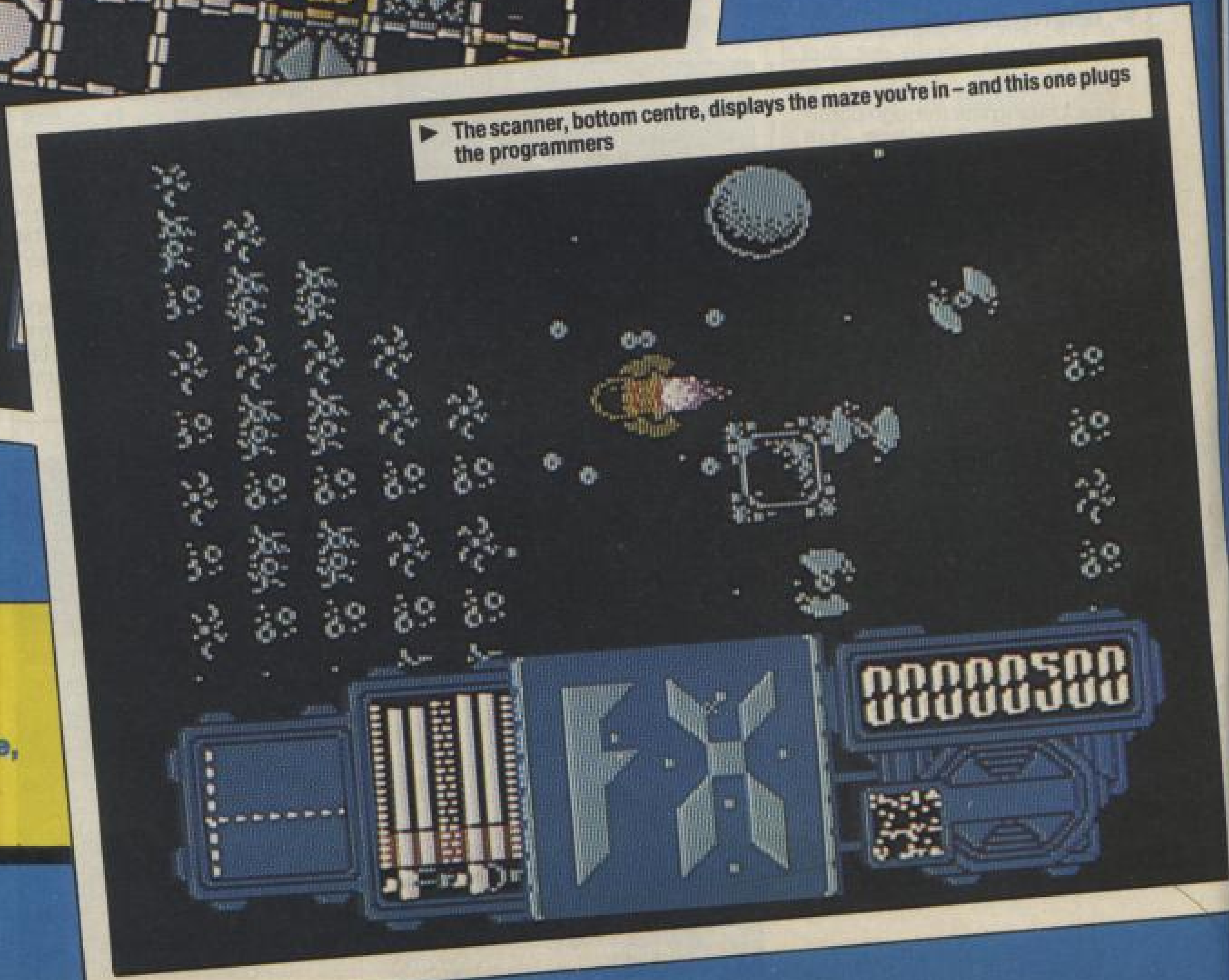




▶ Action speeding up inside the teleporter



▶ Getting from A to B – but how!



▶ The scanner, bottom centre, displays the maze you're in – and this one plugs the programmers

F·I·R·E·F·L·Y

Firefly is an abstract shoot-'em-up – there's no saving-the-world scenario, just a colourful, nail-biting challenge.

It starts on a grid five squares by nine. Down the left-hand side is a row of white squares, and that's where you start in your firefly craft. The aim is to reach a green switch on the opposite side of the grid by moving one square at a time.

Planets and blue triangular symbols are scattered across the board, as well as blank squares. You can land quite safely on a blank square, but landing on a blue square – sometimes essential – presents you with two icons: a thumbs-up and a thumbs-down.

Landing on the thumbs-up allows you a clear path across that particular square, but if you land on the thumbs-down the grid is rearranged and the firefly craft damaged.

So with luck you can move the craft onto the nearest blank space. What then? Well, the craft is shown inside a maze dotted with generators, and the aim of this subgame is to destroy them..

You can enter each generator after collecting four bubble-like structures – and once your inside the generator, another set of thumbs-up/thumbs-down icons appears. To destroy the generator, hit the thumbs-up – if you hit the

NUMBER 50

Producer: Special FX
Retail price: £7.95 cassette, £14.95 disk
Author: Jonathan Smith

A CRASH Smash

" Mix together a shoot-'em-up, a collect-'em-up and a maze game, add sundry reaction tests to taste and you've got a tasty game indeed. Firefly lacks nothing in graphics and gameplay.

Most of the graphics are monochrome, but the player's ship is very nicely drawn and coloured, right down to the satisfying burst of flame which the thrusters emit.

The varied action is very stimulating, even though success in the rather silly reaction games is so vital to progress. The difficulty level of these subgames turns out to be fiendishly pitched; they start off quite easy but soon become 'close your eyes and hope' situations, which might put off the impatient.

But Firefly's addictive challenge would soon entice them back. "

PAUL 92%

thumbs-down by mistake, you lose the bubble structures and again sustain a hefty amount of damage.

And the mazes are inhabited by myriad aliens, ruthlessly efficient at destroying intruders. But some fish-shaped aliens, helpful little chaps, shed water droplets when shot. Collecting these replenishes lost energy and repairs the scratches and dents on the firefly craft.

" Firefly is one of the best games I've played for a long time, though it doesn't sound like much till you've tried it – the graphics are the usual high-quality shoot-'em-up stuff and the gameplay, though original, loses something in verbal description.

But there's addictiveness in oil-tankerfuls; I played Firefly solidly for four hours without wanting a break!

Colour is used nicely, and the sprites are very well-designed; the only complaint I have is that the abort key (BREAK) is too close to the P key on the +2 and +3, which many people use to move right.

But forget the nit-picking; all shoot-'em-uppers should have Firefly. "

MIKE 94%

" Maybe Firefly's gameplay isn't entirely original – but with this sort of quality who cares? The scrolling is faultless, the game is immensely playable and the graphics are very, very good, reminiscent of the old Ultimate style.

And Firefly's addictiveness is deceptive: once you start playing, it drags you in and that's it, you're hooked! The visual patterns can start to get hypnotic if you're not careful . . .

If I were really pushed to find fault, I'd say the teleporter sequence is just a shade too fast – but that's a minor quibble. Firefly virtually overflows with quality, style and sheer excellence. "

ROBIN 91%

A handy map at the bottom of the screen shows where all the generators are; some are isolated and can only be reached by teleporter. There's another challenge: on entering the teleporter, you're confronted by your own ship surrounded by a circle of alternating red and blue squares. To activate the teleporter, just shoot three blue squares in a row – but with each one shot the action speeds up, so a sharp eye is essential!

When all the generators have been destroyed in that particular sector, the display reverts to the opening grid screen, and the square you've just cleared is now coloured white. And you carry on zipping through these tests of skill and concentration till the green switch is reached.

CRITICISM

Joysticks: Cursor, Kempston, Sinclair
Graphics: large and varied monochrome areas, with detailed and smoothly-animated backgrounds and characters
Sound: great title tune on both 48K and 128K versions, plus vitally important sound effects
General rating: what more could an arcade freak want?

Presentation	92%
Graphics	89%
Playability	94%
Addictive qualities	95%
OVERALL	**92%**

Reviews

ROADWARS

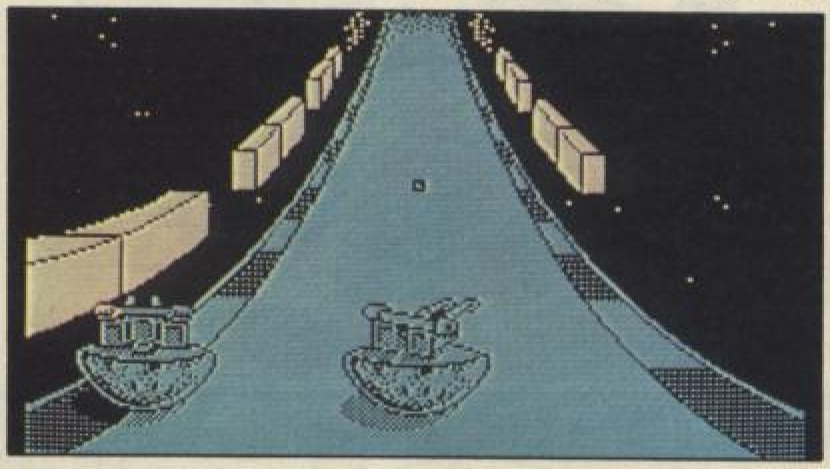
Producer: **Melbourne House**
Retail price: **£8.99**
Author: **D S Whelan, from an Arcadia coin-op**

The planet of Armageddon, the last world to be destroyed under the rule of the Galactic Federation, is encircled by moons, interconnected by vertically-scrolling Space Roadways.

But the safety mechanisms that regulate the status and safety of the Roadways have gone awry – and electric arcs have formed across them, destroying all they touch.

and do some damage even if your shields are up. Spikes in the surface of the Roadways also threaten your vehicle, chevrons can do major damage, and to add to this misery satellites hover at the roadside shooting lasers.

If the battlesphere takes too much damage, the protecting shields are lost and your only hope of survival is quick movement. But to add a little zest to the life of the battlespheres, one can push the



▶ **Beautiful but boring:** *Roadwars*

The Roadways must be cleared, one at a time. Two very manoeuvrable robot droid craft, known as Battlespheres, are to do the job – and you control them.

Both Battlespheres are protected by strong shields which can be drawn back to reveal heavy cannon, and with this weaponry the dark panels which are causing the problem sparks can be destroyed. But if you take out too many of the panels you'll go off the Roadway yourself.

And destructive globes also occupy the heavenly highways; on collision they can destroy a battlesphere with lowered shields,

BYM

" It's a shame the scrolling of the track isn't smoother, and there are a few problems with the battlesphere's movements – they're responsive, but having four actions (sphere left and right, gun turret left and right) controlled by three keys takes some getting used to.

And though the graphics are fine and the idea good, these interplanetary roadways are so long that Roadwars soon gets monotonous – there's nothing to do but shoot up the same nasties on the same track again and again. "

66%

MIKE

I was enticed to play by the large, colourful graphics, and though Melbourne House has done an admirable job on the presentation and packaging this Spectrum conversion fails miserably. "

46%

other from the roadway to avoid collisions.

You can run over arrows to increase your fire power, but be warned – from a distance they're difficult to distinguish from the spikes. No wonder motorways never get repaired.

COMMENTS

Joysticks: Kempston, Sinclair
Graphics: good perspective, with little colour
Sound: title tune and poor in-game effects
Options: one or two players
General rating: beautifully presented (hard box etc) and attractive at first, but soon boring

Presentation	82%
Graphics	79%
Playability	65%
Addictive qualities	65%
OVERALL	**66%**

Best wishes to CRAS

GO!

ocean

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ATF

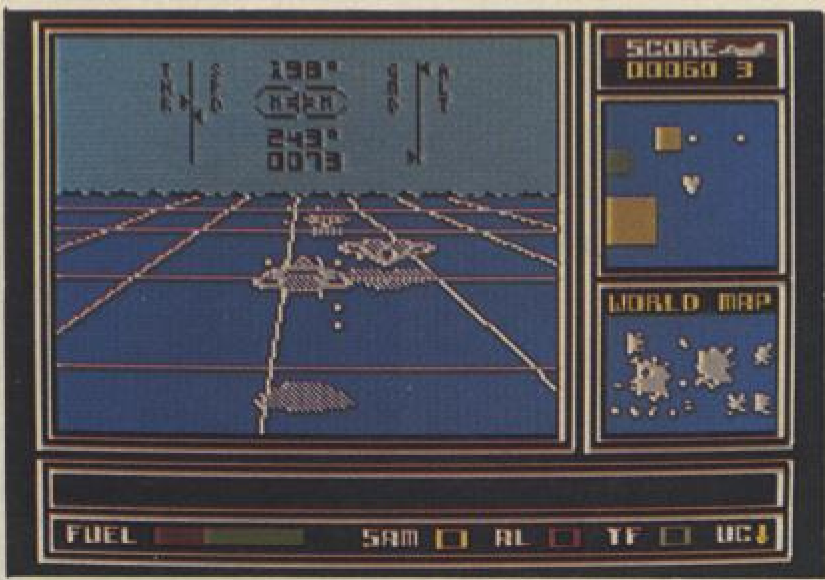
Producer: **Digital Integration**
Retail price: **£9.95**
Authors: **Ian Benyon, Neil Coxhead and Kevin Bezant**

Lockheed's Advanced Tactical Fighter isn't even in production yet, and it's already being acclaimed as the fighter of the next decade. So Digital Integration hits the runway yet again in its search for the simulated 'real thing' with a 3-D arcade/simulation game, *ATF*.

Your ATF is at the forefront of futuristic technocombat when two factions go to war in a nameless 'world' of islands (a new world is generated for each game). Your attacks can destroy opposition land and sea forces and devastate their morale, disrupt their communications, destroy arms-producing industry, and obliterate the air bases where they rearm and refuel. But of course what you can do to them they can do to you . . .

Your own refuelling and rearming is vital, and weaponry must be balanced against fuel supplies so that the ATF can fly within safe weight limits. (The composition of arms and fuel is shown on bar graphs.)

The ATF can be loaded with three types of weapon: fast-firing cannon which can destroy incoming interceptors, visually-guided ASRAAM missiles, and more powerful Maverick missiles which can take out land targets. These Maverick missiles can be guided to targets outside visual range, selected from a database.



► Three weapon systems and endless electronics keep the ATF ahead

Once you're armed and fuelled the main mission can begin. After a takeoff using maximum thrust, the ATF's speed must be kept up if the craft is not to stall, lose height and crash. (If you do stall, immediate thrust is essential.)

Flying low over a vertically-scrolling landscape, the ATF comes under constant attack from enemy forces. It can bank to the left and right, increase and decrease thrust, dive and climb to avoid attack and home in on potential targets.

Enemy radar can be avoided with terrain-following equipment, but this reduces your speed – and the craft's slow reactions could send you hurtling into a hillside.

A head-up display superimposed on the main screen shows engine thrust, the ATF's speed, ground height and altitude. (It's bad news when ground height and aircraft altitude coincide . . .) The missile system available, the current direction of flight and a target's range and bearing are also shown.

Beneath the main screen, further indicators show fuel level and undercarriage status, and warn of incoming missiles. An in-flight message window gives vital information on your mission, and a short-range scanner to the side of the main screen shows the type terrain below and nearby enemy objects.

Approaching ground-to-air SAM missiles register on a warning system, and with skill they can be jammed in time using the ATF's onboard jammer.

Then there's the ATF's flight computer, showing enemy positions on a world map and the status of weapons systems and the ATF itself. The computer also holds a database for locking on to targets.

An automatic landing light is activated when the ATF enters the catchment area surrounding allied bases. When a base has been chosen, an automatic landing sequence can be engaged.

And a war situation report – giving a rundown of all recent gains and losses of allied and enemy bases, ground and sea forces, and communications and industrial complexes – is called up whenever the ATF returns to an allied base. This strategically valuable information can make all the difference between success or failure in war.

NATHAN

" ATF is awesome – the graphics are superb, and the landscapes give it a futuristic feel. The enemy ships look most impressive and realistic when they're tailing your ATF, darting around at speed and copying your every move.

And unlike other flight sims it's fast, responsive and easy to control; it's easy to glance at onscreen information without being shot to pieces or crashing into a mound of earth.

ATF is a state-of-the-art simulation, capturing the movement of a supercharged aircraft. "

85%

PAUL

" Digital Integration doesn't come out with many products, but every one is a leader in its field – Fighter Pilot **is a fantastic flight simulator,** Bobsleigh **admirably transfers a very hard-to-computerise sport to the Spectrum, and now** ATF **is a superb shoot-'em-up.**

What's most impressive throughout ATF **is the construction and animation of the graphics: Digital Integration has found a new way to overcome the graphical limitations of the Spectrum.**

Gone are the hollow wireframe graphics of Tank Duel **and its kind. Here the landscape seems very solid – especially when you hit it! – and colour bands are widely used to add variation.**

My only gripe is that the gameplay is very repetitive – even more so than Starglider**. But, like Rainbird's Smash of a year ago,** ATF **mustn't be missed. "**

85%

BYM

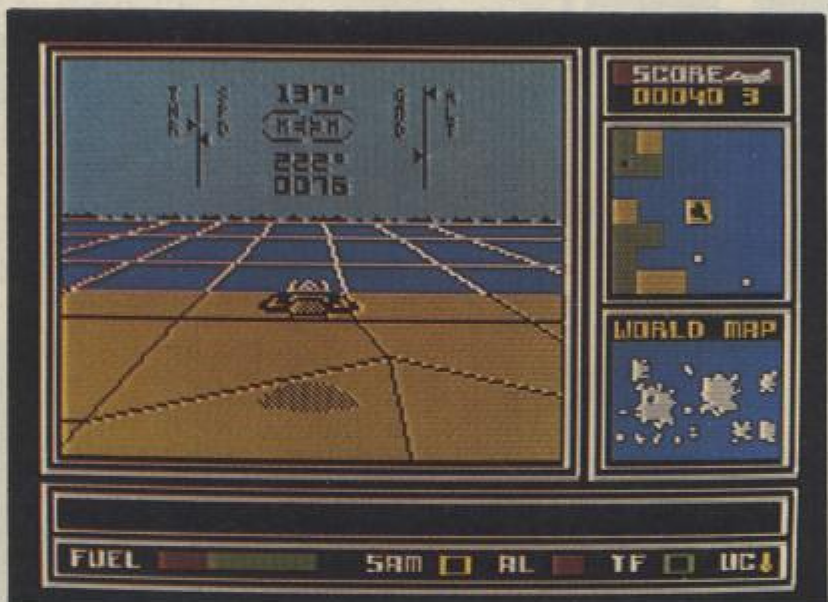
" Like all flight sims, ATF **has quite a few buttons to keep your eyes on. But it's not as slow and laborious as other flight sims – such as** Gunship **– and not that complicated either.**

Seeing your ship on the screen does a lot for the game, too. You can see your enemies coming from behind, and tell at a glance how your undercarriage is and how fast the ground is coming up, all without having to look at banks of instruments.

Still, as a flight sim ATF **demands real involvement – and a lot of reading in the flight manual. Becoming an expert will take some work, but you could play** ATF **for a long time and still enjoy it. "**

96%

► 'Powerful 3-D on a smooth-scrolling landscape'



COMMENTS

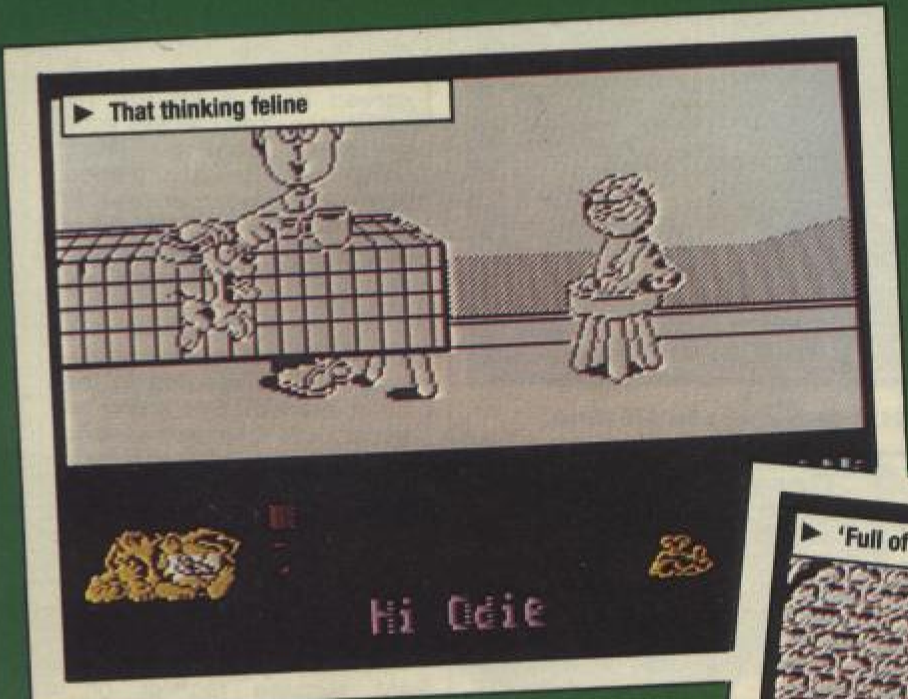
Joysticks: Cursor, Kempston, Sinclair
Graphics: the smoothly-scrolling landscape gives a powerful 3-D impression, and enemy fighters are tremendously detailed
Sound: very simple white-noise effects
Options: eight difficulty levels, sound on/off
General rating: excellent: impressive arcade elements in a user-friendly simulation

Presentation	87%
Graphics	92%
Playability	85%
Addictive qualities	85%
OVERALL	**89%**

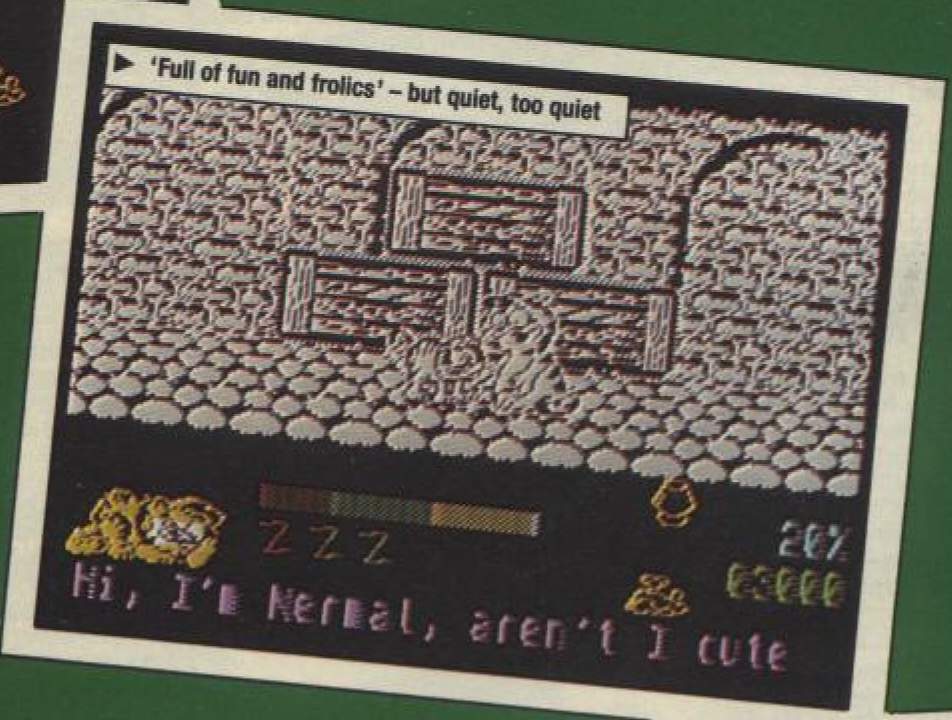
Garfield IN B·I·G, F·A

That fat, overblown, waddling, lazy scoundrel of a cat Garfield is out to do his good deed for the day – his feline friend Arlene has been taken to the local pound, and it's all down to Garfield to pluck his true love from her imprisonment. But first he must get out of the house, and that won't be easy.

Garfield, the comic-strip cat brought to the Spectrum screen for his tenth birthday (see Big, Fat, Hairy Licence on this page), has two appetites – one for food and the other for rest. So this heroic



▶ That thinking feline



▶ 'Full of fun and frolics' – but quiet, too quiet



▶ Big, fat, hairy but perfectly formed: graphics 'very close to the comic-strip originals'

NUMBER 50

Producer: **The Edge**
Retail price: **£8.99**
Author: **Steve Cargill**

A·T, H·A·I·R·Y D·E·A·L



ball of fluff must keep on consuming food, or he'll become very tired, drop off to sleep and leave Arlene languishing in the pound.

But at least there's more to eat than dry meal. There's his 'master' Jon's coffee, for a start; and later on Garfield can scoff a string of sausages and numerous other scraps. And this cat has a helpful digestive system – watch out for the Snack Attack warnings which appear periodically below the main screen. When there's a Snack Attack on, the flabby beast can nosh practically anything.

Garfield can be helped or hindered by his ever-present pooch Odie. Our hero doesn't really deserve this faithful dog as a friend – a well-aimed swipe at Odie earns points for the callous cat. Still, Odie doesn't seem to mind this mistreatment, for he always bounds back for more.

Garfield can also get help from his nephew, Nermal, the cutest little kitten ever – if he can find him.

Now Garfield is not the most house-proud or best behaved of cats – given half a chance, he likes nothing better than to tear the best chair's upholstery apart and add a stack of points to his collection. Still, the purple Dralon never did look too good on the three-piece suite, did it?

Messages at the foot of the screen keep up a running commentary, and useful objects lie around for Garfield to gather. There are newspapers, dog bowls, bones, towels and tin cans – but it takes some experimentation to find out what they're used for.

And if he does make it out of the house into the bright light of day, Garfield will be distracted all the way to the pound by useful places such as butchers' shops – in fact, they may prove so diverting that the fat cat never gets to free his long-suffering Arlene at all.

" Big, Fat, Hairy Deal **is brilliant! It's totally addictive, with perfectly-animated cartoon characters, jokes and surprises around every corner and the joy of kicking Odie up the rump every now and then.**

The excellent graphics have some really effective shading, and all that lets the game down is the lack of colour and sound – a tune would have cheered it up a bit.

Our lasagne-loving friend leaps and bounds around the screen in a genuinely cat-like way with Odie following close behind – but if Odie touches Garfield the cat gets very tired, so the best idea is to give him the boot.

There's a serious aspect to the game, though, and the puzzles get more involving as you progress. This is a great game, full of fun and frolics, so get down to your local software shop and have a Big, Fat, Hairy Deal! "

NICK **92%**

" Big, Fat, Hairy Deal **captures exactly the combination of sardonicism and wit found in the cartoon strip. All the characters are superbly animated, making full use of the Spectrum's high-resolution graphics; Odie is my favourite, bouncing happily around the screen with his tongue hanging out. And Garfield's expressions are simply brilliant – he veers from wide-eyed surprise to a fantastic toothy grimace to a cynical grin.**

The monochromatic graphics suit the cartoon style perfectly (the colourful information panel detracts from it, if anything). And though some backgrounds lack detail, others – such as the park and the sewers – are very good.

The messages really add to the atmosphere of humour and laziness, and it's very satisfying to be able to kick Odie away if he's bothering you!

There are a couple of very minor faults: a bit of colour clash, and an inexplicable change of direction when you're in the street. Forget them; though this is in a simple arcade adventure format, it's been made into something really special. "

GORDON **89%**

" This is a really good laugh! The graphics are very good; some of the characters and animations belong in On The Screen, though the monochrome display is a bit disappointing. Big, Fat, Hairy Deal **is a must for Garfield fans, simply because it recreates the comic's characters so well.**

Odie is very annoying – that's true to the original, I suppose, but he does tend to get on the nerves more than he should.

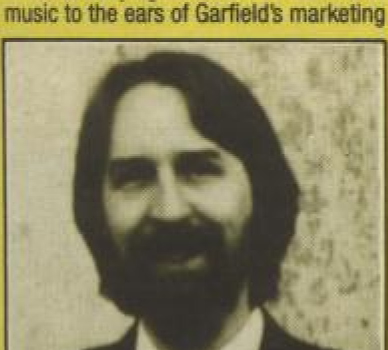
Still, there's lots to do and I'm still trying to work out what loads of things can be used for. And the lack of sound is no problem when a game's as addictive as this. "

MIKE **89%**

BIG, FAT, HAIRY LICENCE

COPYCAT CRIME took on a wacky new meaning in California this January, when 45 cars were broken into on a single weekend – and Garfield car stickers stolen from every one!

But the crying of distant car alarms is music to the ears of Garfield's marketing men in Indiana, where the fat cat's tenth birthday on June 18 is hyping Garfieldmania to new heights.



▶ **Making the most of a megalicence: The Edge's Tim Langdell**

Garfield, born as the star of a still-running comic strip by Jim Davis, also appears on all kinds of merchandise including calendars, T-shirts, and cuddly toys.

'Garfield is one of those rare characters that has a following from five to 95,' explains The Edge's Tim Langdell. 'The average person knows Garfield.'

And plenty of them snuggle up to him every night – 'when we were making the game a lot of people came out of the closet and admitted they had the cuddly toys', Langdell laughs.

But The Edge was duty bound to keep skeletons out of the comic-strip cat's closet – there was 'very firm guidance from above as to the image of Garfield', recalls Tim Langdell's colleague and wife Cheri Langdell.

'He can't utter any profanities, he can't really smash somebody or kill them – he's got a sort of moral tone.' The cute creature can't die in the game, either – he just falls asleep (remember Piranha's *Yogi Bear*, reviewed in Issue 47, where technically it isn't the precious licensed character but you, the player, who dies?).

In the event, only one of The Edge's proposed scenes was cut from *Big, Fat, Hairy Deal* – where Garfield was 'using an instrument to do something that might be considered aggressive', says Tim Langdell.

And he hopes that despite the tight control, *Big, Fat, Hairy Deal* will have wider appeal than other recent character licences. 'There's been a large number of character licences,' he observes, 'almost all of which have been poorly received. There's a lot more that can be done with a licence than's been done so far.'

The perfect licence might need a 16-bit machine, says Tim Langdell, but he's got high hopes for the Spectrum Garfield game. 'It's a very complex adventure,' he enthuses, 'and only bright teenagers and adult players will actually solve it. It's pretty hard to do, but it won't put off youngsters.'

After all, he says, 'the strip cartoon isn't aimed at kids'.

And the Langdells are so confident they're backing a winner that more Garfield games are in the works already – with the cat's creator, Jim Davis, helping out.

The first sequel could be out by April. And 'we expect *Big, Fat, Hairy Deal* to be big till Easter,' says Cheri Langdell. 'Garfield will have a perennial popularity.' So don't leave him in the car.

COMMENTS

Joysticks: Cursor, Kempston, Sinclair
Graphics: very close to Jim Davis's comic-strip originals; monochromatic playing area
Sound: nothing but walking effects
Options: definable keys
General rating: funny and addictive – with real arcade-adventure challenge as well as comic-strip slapstick

Presentation	90%
Graphics	89%
Playability	91%
Addictive qualities	90%
OVERALL	**90%**



▶ **It's a gas:** *The Krypton Factor*

THE KRYPTON FACTOR

Producer: **TV Games**
Retail price: **£7.95**
Author: **G Benson**

Intelligence, quick thinking and athletic ability are just some of the skills needed to prove yourself in *The Krypton Factor*. Based on the long-running Granada TV series, which has been putting suckers through their gruelling paces for a decade, this licence from Domark label TV Games throws up to four contestants into the ring.

The Krypton Factor consists of six rounds testing mental agility, observation, response, physical ability, intelligence and general knowledge; players can choose their 'characters' from among four men and four women before the first round (participants in the TV show are ordinary members of the public).

In the mental-agility round, a series of numbers appears briefly onscreen. The digits must be remembered and rearranged into ascending order. At first there are just six numbers to struggle with, but this can increase to a maximum of nine.

Next there's an observation round. Here a picture appears with a scrolling story line beneath; picture and words then disappear to be replaced with a subtly different alternative version. The contestant must identify the changes within a time limit.

In the two-part response round, contestants' reactions and responses are tested on the Ergobuggy and Vidiwall. The first is a strange combination of rotatable pedals, some moved by the legs (as on a bike) and others by hand. The two sets of pedals must be rotated at different speeds to propel the buggy forward – it's a tricky test of coordination.

And the Vidiwall is a large square formed of many video screens, which randomly change colour. The player must decide in a split second which colour is shown on most screens, and then hit the key which represents that colour. The first contestant to do this correctly *ten times* wins the round.

Sheer physical ability is now tested on an assault course, where players can adjust their contestants' stamina and strength in both legs and arms. Different obstacles, which include the net climb and a high wall, require different combinations of strength and stamina; in some you must rely on arms, in others on legs.

Next it's the turn of brainpower, as each contestant is challenged to piece together the parts of the *Krypton Factor* logo. Some of these pieces can be turned and fit within a grid; others can be removed from the grid and repositioned.

The last round tests the general knowledge of the contestants. Questions scroll across the screen, and in time-honoured quiz-show fashion the first player to press his key gets to answer. The correct answer is then revealed onscreen, and the game relies on players' honesty in admitting when they answered incorrectly.

CRITICISM

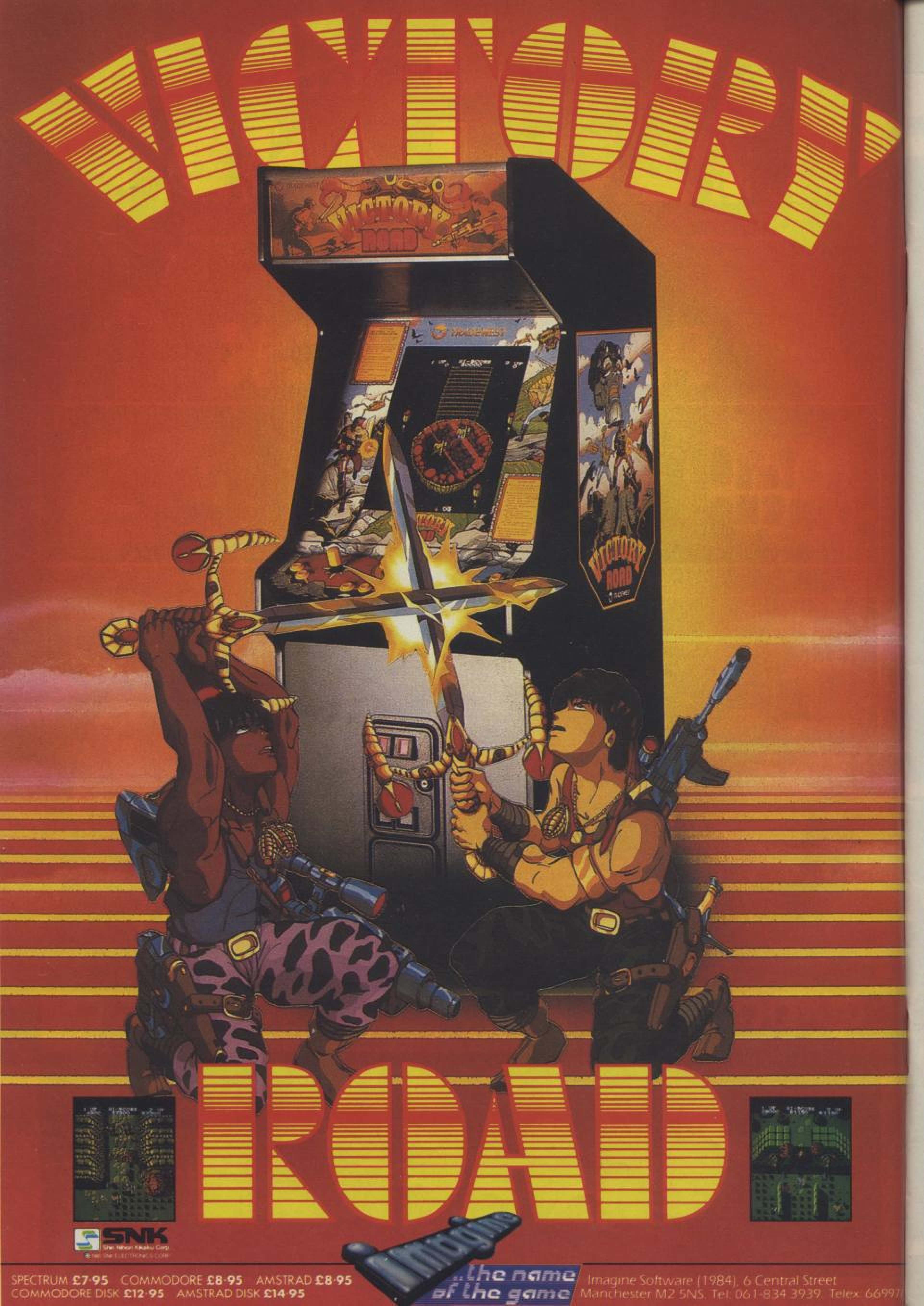
● " The mental test is the same every game, which destroys the point, and the response test is also soon mastered. The point of the TV show was that it put untrained people in demanding situations; as an unchanging computer game *The Krypton Factor* is quite silly, because results can be improved with practice. "
BYM **37%**

● *" Not only does the Spectrum music sound nothing like The Art Of Noise on the TV show, but the game ranges from the appallingly bad Ergobuggy section to the astoundingly simple, though adequate, mental-agility round. It says something that the best section of the game involves putting half a dozen numbers into ascending sequence – I would only recommend* The Krypton Factor *to those who see themselves in the half-dozen preset personalities. "*
MIKE **32%**

COMMENTS

Joysticks: none
Graphics: lacking detail, but not colour
Sound: simple title tune, unimaginative effects
Options: choice of eight charismatic contestants; up to four players
General rating: a simply constructed (but mentally demanding) repetitive quiz game

Presentation	60%
Graphics	50%
Playability	39%
Addictive qualities	37%
OVERALL	**37%**



VICTORY
ROAD
SNK
Shin Nihon Kikaku Corp
imagine
SPECTRUM £7·95 COMMODORE £8·95 AMSTRAD £8·95
COMMODORE DISK £12·95 AMSTRAD DISK £14·95
...the name of the game
Imagine Software (1984), 6 Central Street
Manchester M2 5NS. Tel: 061-834 3939. Telex: 66997

PHM PEGASUS

Producer: **Electronic Arts**
Retail price: **£8.95 cassette, £14.95 disk**
Authors: **Lucasfilm**

Top American software house Electronic Arts, which established itself in Britain last autumn, has finally released a Spectrum product – *PHM Pegasus*, one of the flashy, complicated simulations for which the company is famous. But this is no ordinary flight or driving simulation: PHM stands for 'patrol hydrofoil missile craft'.

The eponymous *PHM Pegasus* is a hydrofoil, a fast, light craft that hardly touches the water's surface. The hull of a hydrofoil is supported high above the waves by fin-like vanes which minimise friction and improve the craft's efficiency – deadly efficiency where *PHM Pegasus* is concerned.

With basic training complete, you're flung into sea combat against other vessels, at first in training missions, and later in a series of increasingly difficult forays. Fleeing terrorists must be intercepted, two missile corvettes sought and destroyed, vital convoys escorted through dangerous waters and a secret photographic mission undertaken.

Though the game title suggests a single craft, you can choose to command any one of three NATO hydrofoils from the US, Israel and Italy.

Your hydrofoil operates in two states. In **manoeuvre mode** a large-scale sea-and-land map of the operational area appears onscreen, marking the positions of your craft, enemy forces, and friendly bases and controllable back-up helicopters. Information about the hydrofoil's speed, the time remaining for your mission, and the speed at which the game is set to run is displayed beneath.

In **weapons mode**, the operational map is replaced by a view from the hydrofoil's bridge, showing the sea ahead – and any enemy craft.

Beneath this is the instrument console of *PHM Pegasus*. At the centre is the vessel's radar screen indicating enemy shipping within a 40-mile range, and there's a gyrocompass and depth indicator for navigational purposes. Engine revs, the hydrofoil's speed and its fuel level are displayed on bar indicators.

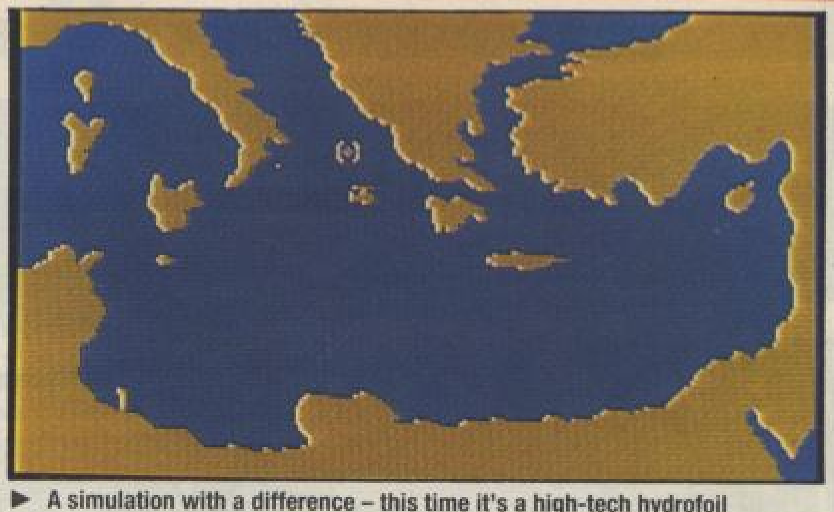
Your hydrofoil carries a cannon, chaff rockets to deflect oncoming enemy missiles, and Gabriel, Exocet or Harpoon missiles. Weapon system displays indicate the weapon currently engaged and how much ammunition remains.

When weaponry is activated, a binocular view of the prospective target appears at the top of the screen, and a gun sight can be focused on the enemy vessel within it. Aim-correctors at the sides of the binocular view help greater accuracy, though a missile automatically locks onto its target when fired.

On certain missions, one or two reconnaissance helicopters can be called up to supplement your resources and provide invaluable help. They're directed by positioning onscreen cross hairs over their destination and setting their speed.

A 'lock' light provides ominous warning that an enemy missile has, or is about to, lock on to the vulnerable *Pegasus* – and in the damage sector of *PHM Pegasus*'s console two profiles of your hydrofoil and its watertight compartments monitor the effect of enemy attacks. When one of the compartments is damaged, it is coloured yellow or red, depending upon the seriousness of the damage.

Weaponry, fuel and systems can become inefficient or useless when damaged, and different NATO vessels can withstand different amounts of damage before sinking.



► A simulation with a difference – this time it's a high-tech hydrofoil

Points are awarded based on your success in achieving the mission objective, the number of enemy kills, the number of enemy craft damaged and the mission time remaining – and there's a bonus for bringing *PHM Pegasus* through its difficult mission with as little damage as possible.

At the end of each mission the player is given a rank, ranging from Deck-Mopper to Admiral!

MARK

" Like most battle simulations, PHM Pegasus **demands a thorough read of the technical manual – so it should appeal to strategy buffs, if not so much to straightforward zappers. The graphics are good, with the various dials and meters clear and well set out, and the binocular view of enemy ships is effective. "**

79%

NATHAN

" Naval combat isn't used much in games, which makes this one original and fresh. There are some nice slick touches, such as the view through binoculars, and lots to do. But each function is easy to understand and operate, though I started out as Deck-Mopper and finished as Deck-Mopper . . .

PHM Pegasus **is the** Elite **of the seas and a state-of-the-art simulation. "**

87%

PAUL

" What looked like another rather highbrow naval combat simulation proved to be the standard Lucasfilm product – a 3-D shoot-'em-up – at sea. So the idea is a good one, and some 'real-life' missions add spice.

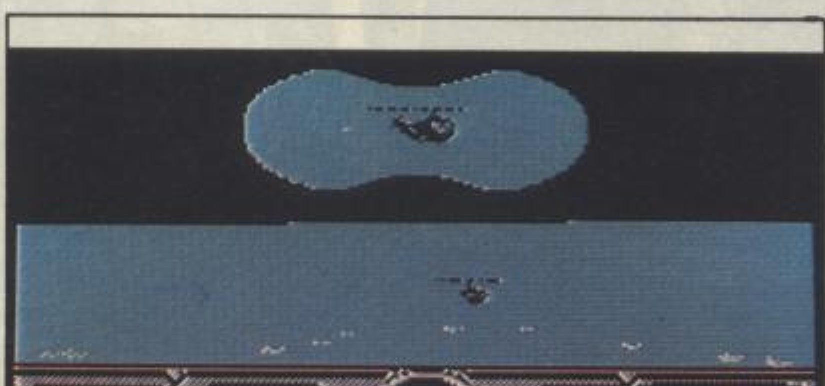
The controls are well designed and laid out simply. But the control-panel graphics are let down by the representations of the enemy ships, which are virtually unidentifiable even through binoculars.

And the view from the bridge seems to have the wrong perspective, which knocks the all-important realism.

Add to that the repetitive action – blast a ship and move on to the next one till they eventually get round to blasting the bilge out of you – and Lucasfilm's product is a little lacking in polish and addictiveness. PHM Pegasus **is not the team's best job of blending arcade and simulation. "**

70%

► 'The *Elite* of the seas' or 'lacking polish and addictiveness'?

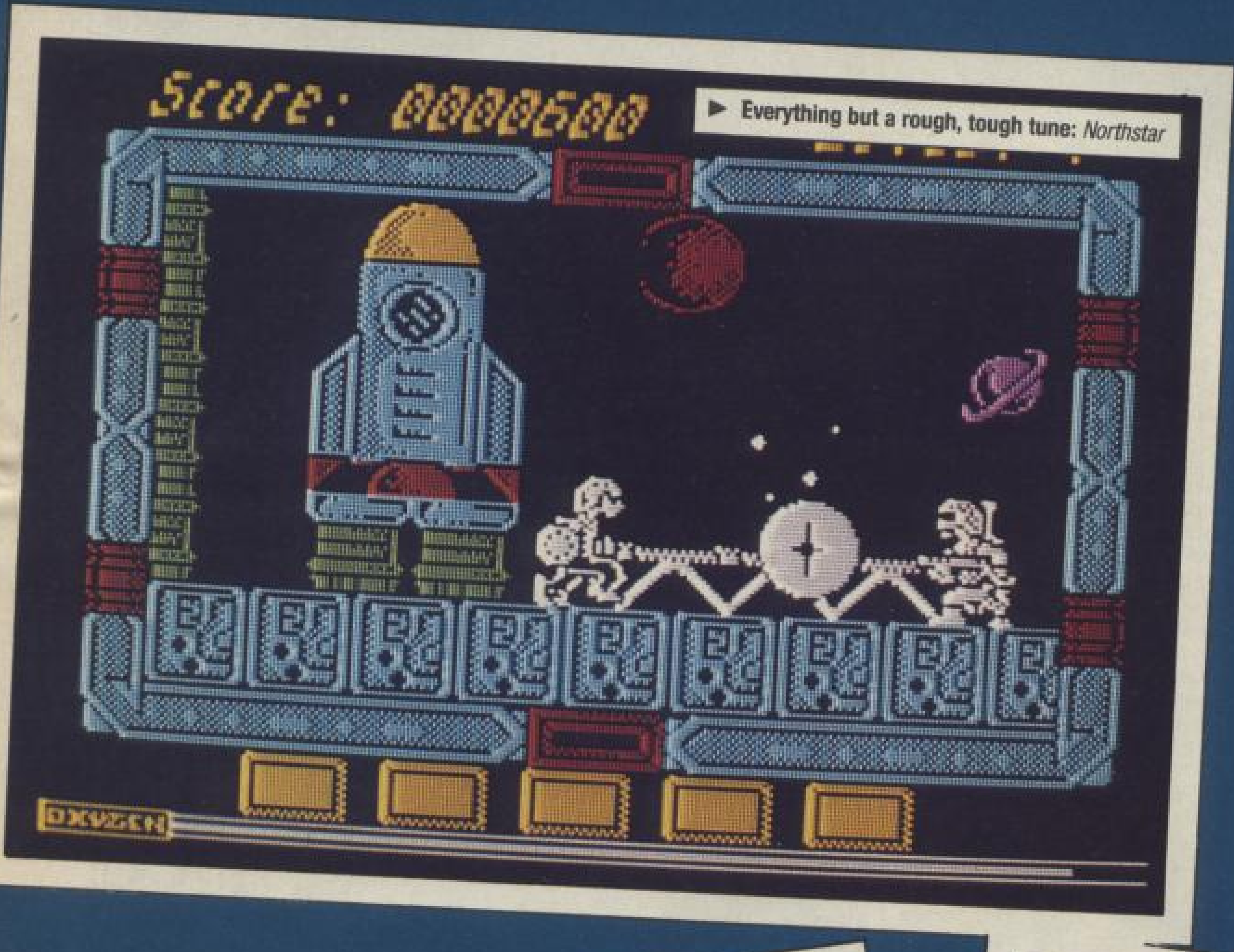


COMMENTS

Joysticks: Kempston
Graphics: a well-set-out display, but indistinct enemy ships
Sound: atmospheric – ie few spot effects
Options: choice of eight missions and three boats; playable in real time or at any of seven other speeds, up to 128 times real time
General rating: Lucasfilm captures the excitement of guiding a gunship – *PHM Pegasus* should appeal to all ageing *Elite* fans

Presentation	80%
Graphics	79%
Playability	75%
Addictive qualities	74%
OVERALL	**79%**

N·O·R·T·H·S·T·A·R



▶ Everything but a rough, tough tune: *Northstar*

Orbiting Earth, surrounded by mystery, is the largest space station ever conceived. Built to solve problems of overpopulation and starvation on our planet, the vast construction was nearing completion when Earth lost all contact with it – and in *Northstar* you are sent to investigate the silent space ark.

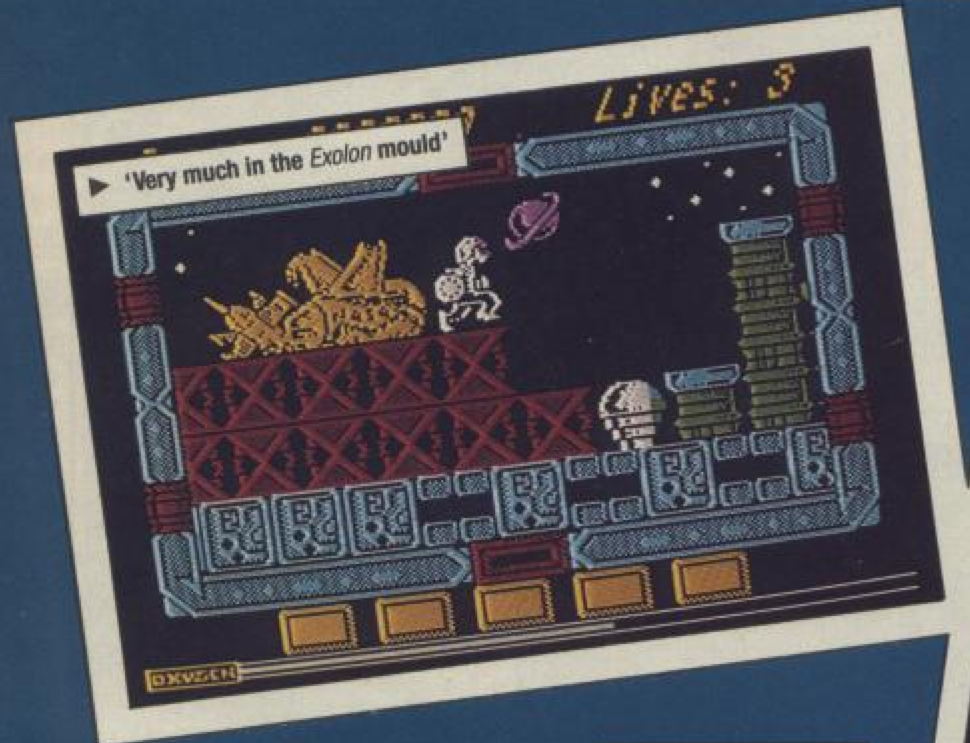
But aliens, scheming to destroy human existence with their devastating weapon of predictability,

" Northstar is really good and had me hooked in minutes. The graphics are superb, with loads of colour used to excellent effect, and brilliant characters.

And the highlight of the fine sound is a synthesized tune on the title screen with the novelty of varying volume, fading bits and everything!

There's loads of playability and an addictive challenge too. "

MIKE 90%



▶ 'Very much in the *Exolon* mould'



▶ Atmosphere in outer space

NUMBER 50

Producer: **Gremlin Graphics**
Retail price: **£7.99 cassette, £12.99 disk**
Author: **Jon O'Brien**

have occupied the station. You must eliminate the hostile forces, complete each of the levels of the space station, and reactivate the life-support system – that is, if any of the human staff are left to make use of it.

Of course you carry a weapon, a short-distance lance, and earn points for destroying aliens – patience and quick firing are important. And you can bound over the obstacles that block your path.

To help you survive the rigours of space, you have been equipped with implanted oxygen converters, and an onscreen indicator shows how much breathable gas remains. If it falls to zero one of your four lives is lost, and you are no closer to solving the strange and dangerous problem of this eerie space station.

" Northstar **is very much in the** Exolon **mould, so it's very playable and addictive. The graphics are tremendous, with beautifully compact animation on all the characters and detailed, colourful and unusual backdrops.**

And you don't notice how small the playing area is, because there's such a mass of detail: for example, there are clouds of dust when your character skids, and your weapon is an extendable claw which needs to be controlled rather than a gun spraying bullets. It all contributes to the unearthly atmosphere.

The presentation is equally excellent: the title screen is superb, and the strange music fits the unusual atmosphere well.

The gameplay is excellent: it's not so much a question of furious blasting as of timing and strategy combined with killing. Northstar **strikes a balance between frustration and addictivity, and it's a compelling and successful game. "**

GORDON **91%**

" Northstar **looks simple but it's surprisingly addictive. There's not much colour, but the screen is quite effective and the gameplay provides a lively all-action arcade adventure with plenty of opportunity for the death and destruction of the alien horde. (Running around jumping over barriers and biffing aliens with my hydraulic arm reminded me of school athletics!)**

Northstar **is very playable and exciting – all it lacks is a rough tough tune. "**

NATHAN **90%**



COMMENTS

Joysticks: Cursor, Kempston, Sinclair
Graphics: superbly-designed characters and a fantastic use of colour, complemented by attractive animation
Sound: atmospheric synthesized tune and attractive spot effects
Options: definable keys
General rating: one of the best walk'n'whacks we've seen, colourful and detailed as well as addictive and playable

Presentation	93%
Graphics	88%
Playability	91%
Addictive qualities	90%
OVERALL	**90%**

CAPTAIN AMERICA
IN THE DOOM TUBE OF DR MEGALOMANN

Producer: **GO!**
Retail price: **£7.99**
Author: **Adventuresoft**

A good villain doesn't give up easily – supposedly dead, the evil Dr Megalomann (he'd hardly be Dr Barnardo with a name like that) returns to offer the President of the USA an ultimatum: hand over his power to the mad doctor, or see the world plunged into mayhem.

If Megalomann doesn't get his way, he's going to throw a terrifying tantrum and launch a missile carrying a deadly virus.

The mad Doctor's desert headquarters consists of three cylinders, one inside the other – forming the Doom Tube. Each cylinder is divided into decks (levels), with each deck subdivided into quadrants (rooms). And an elevator, the Orbivator, runs between cylinders.

But it's not all plain Orbivating if you want to save the world. The virus has spread into the quadrants – some are more poisonous than others – and though Captain America has been injected with a protective serum, if a quadrant is too toxic it will kill him.

The serum that keeps Captain America safe is only temporarily effective, but the ingredients to make more can be produced in the converter quadrant – if Captain America can get that far.

The converter is activated by touching certain wall panels and placing sufficient quantities of Yin and Yang, the essential components of the vital vaccine, in receiver plates. Yin and Yang can be obtained by blasting a doom pod found in one of the quadrants.

Captain America may be the pinnacle of physical perfection, but these 240 pounds of pure athletic beefcake cannot go it alone, so the good Captain carries a virtually indestructible shield. With this he can deflect all projectiles and nearly all energy beams – save for psion energy, which unfortunately he finds within the Doom Tube.

And in some rooms rotators rove through the air, sending out lethal beams. But on destruction these rotators release a code word which can be helpful in accessing later areas of the Doom Tube.



If Captain America can reach the Doom Tube's final deck, perhaps he can disarm the missile and save the world – but the game is played in real time, and you have just an hour before Megolamann's deadly deadline.

CRITICISM

● **" I used to think Captain America was the square-jawed, strong, handsome, young American comic-strip hero who always won – but the big brave image of this superhero was tragically shattered by GO!'s licensed game.**

The playing area is cramped, though the graphics are quite detailed, and the only really good thing is the tune – otherwise Captain America **strays too far from the spirit of the comic-book hero, "**

NATHAN **34%**

● *"Graphically* Captain America *is only average; it's well-drawn, but the colours used are garish and annoying, and harsh contrasts make gameplay a bit confusing.*

A bit of interesting black comedy puts more spice into the game than the limp Resister soundtrack does, but a couple of good jokes don't justify this kind of price. If you want to save America from a slow, agonising end, that's up to you; if you want to do it by playing this game, forget it. "

GORDON **30%**

COMMENTS

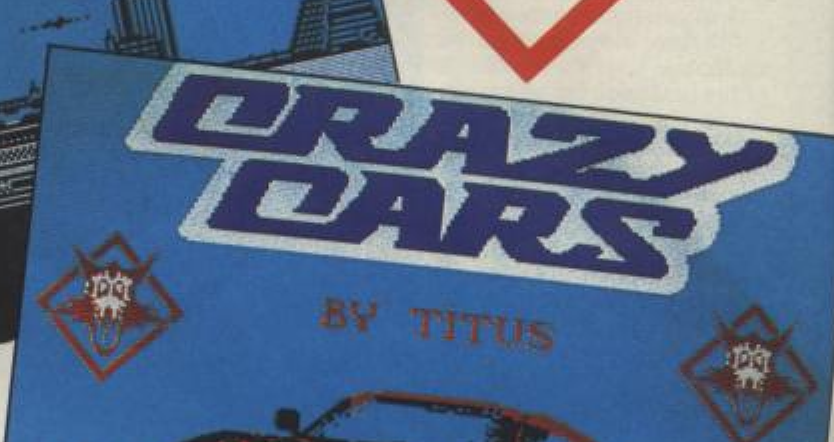
Joysticks: Cursor, Kempston, Sinclair
Graphics: colourful but poorly-defined characters
Sound: tune, poor effects, song – *Who's Crying Now* – from obscure band Resister on side two as marketing gimmick (in mono)
General rating: a disappointing licence, wasting great potential

Presentation	50%
Graphics	53%
Playability	38%
Addictive qualities	30%
OVERALL	**36%**

DRIVE YOURSELF CRAZY WITH TITUS

COMPETITION





CRAZY CARS

TEN RADIO-CONTROL FERRARIS MUST BE DRIVEN AWAY!



SORRY, Florida isn't the place to be any more – not according to **Titus**'s high-performance road riot *Crazy Cars*. Malibu Beach in California is where it's at now, so hit the road . . . but all you have for transport is a Mercedes 560 SEC V8, and we all know how slow and dilapidated *those* are!

Still, if you can reach Malibu in time, beating the clock and the risks of the road on six courses, you'll be rewarded with a Porsche 911 Carrera in which to attempt the journey again.

It's all in *Crazy Cars*, the first British Spectrum release from French software house Titus (THE GAMES MACHINE described it as 'addictive and entertaining' and we'll have it reviewed next issue, with luck). *Crazy Cars* offers four increasingly posh motors for you to drive like a mad thing across the American desert roads, culminating in the ultimate posing machine – a Ferrari Testarossa.

The Testarossa starts here

HEADLIGHTS BLAZING!

Nikko's amazing supercharged racers can speed forwards and backwards, they're fully steerable, they have a speed-selector switch – high for the real Nigel Mansells, low for the wimpy CRASHers – and they feature a neat turbo-boost function . . . which means they go like a bat out of hell across the carpet with headlights blazing.

Ten lucky winners will each receive one of these beautiful models plus a copy of *Crazy Cars*, so they can make test runs on their Spectrums. And **ten runners-up** will each receive a copy of the game, too.

Just trace the route of the Testarossa on our puzzle – does it end up at point A, B, C, D or E? Ring one on the form, and send it off to **CRAZY ABOUT TITUS COMPETITION, CRASH, *PO Box 10, Ludlow, Shropshire SY8 1DB*** to arrive by **April 5**. Remember, the decision of CRASH's appointed judges is final in all respects, and they don't like back-seat drivers.

NUMBER 50

The Testarossa finishes at point

A B C D E

NAME ....

ADDRESS ....

....

.... **POSTCODE** ....

A B C D E





CRAZY CARS

THE REAL TESTAROSSA

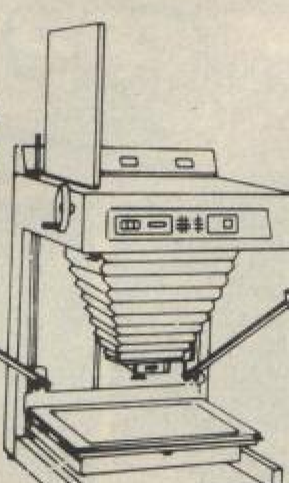
When you've finished *Crazy Cars* – if you ever can – you'll be yearning for the real thing. So Titus, high-tech model-manufacturer **Nikko** and CRASH have joined forces to bring you a Testarossa of your own.

Ten radio-controlled models of the Ferrari Testarossa are up for grabs!





Out of this world.
BEST OF ELITE Vol. 1
1) BOMBJACK © 1985 TECMO, LTD.
2) FRANK BRUNO'S BOXING © 1985 ELITE
3) COMMANDO © JAPAN CAPSULE COMPUTERS (UK) LTD 1985
4) AIRWOLF © 1984 UNIVERSAL CITY STUDIOS, INC.
BEST OF ELITE Vol. 2
1) PAPERBOY © 1984 ATARI GAMES, INC.
2) GHOSTS 'N GOBLINS © JAPAN CAPSULE COMPUTERS (UK) LTD. 1985
3) BATTLESHIPS © ELITE 1987
4) BOMBJACK II © TECMO LTD. OF JAPAN
Best of Elite Vol. 1
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HIT
NOW AVAILABLE ON SPECT
ELITE SYSTEMS LTD., EASTERN AVE
Consumer Hot Li





CRASH
50
CRASH
50



It's becoming a good winter for letters. I suppose the Christmas Special and indeed all the autumn issues were something to do with that, because the great undertaking of The CRASH History and, less happily, the misbegotten CRASH fanzine CRUNCH were bound to provoke some criticism. (Though mind you on rereading CRUNCH I saw what they were getting at – it's not overelaborate and there are some funny touches as well as the excellent idea of sticking tips at the end of each review. Perhaps Nick needs prodding on that . . .)

But this month's special prize – £50 worth of software for Issue 50 – goes to a letter of complaint which I felt was whingeing and self-glamorisingly cynical. I can't believe anyone can bear such apparent venomous hate toward a magazine simply because they didn't like one issue . . .

EXTREMELY ANNOYED

Dear Lloyd
This letter will never be used in your magazine, as it is too much the truth, and if it is, it will only be printed so that you can use any 'protect and defend our precious CRASH' replies that you might get!

CRASH has undergone many changes since Issue One, some good, some bad, but I have always bought it as I used to think it was the best magazine for ardent Spectrum fans. However, there is one final alteration that must be made. That is the name of the publication. No longer can it be called 'CRASH' – it must be renamed 'CRAPP'.

Yes, after buying the Christmas Special I was disgusted. Not only was it late (it didn't appear anywhere on 10 December), but I, and my wife, counted over 100 pages of adverts and CRASH History covers. What a bore! I have every issue of CRASH already, so I have therefore no need for any extra covers, thank you.

So Newsfield are participating quite nicely in the season of goodwill and daylight robbery. £1.95 for a Xmas Special!! The only thing at all seasonable about it were the words 'Christmas Special' on the cover and a bit of snow on the CRASH logo!

As for the two Smashes, both Ocean, probably the biggest income for CRASH on advertising, so we have to keep them sweet don't we? I mean, *Match Day II*, it's the same old game with a little cosmetic surgery, init! Perhaps it was Smashed because someone had a guilty conscience for not Smashing it first time round.

And as for Derek Brewster leaving, why are you not getting another adventurer to review games? Tony Bridge is probably ideal for the job. I mean, how can your reviewing team do the job properly, when they are obviously only fans of arcade games? And what does 'they will be reviewing the major releases' mean? Does this tell us that the smaller software houses won't get a look in? Most of the best adventures are from smaller companies and are only available on mail order, so if they aren't getting a chance, how do we know where or how to get them? Are you not going to review any of these smaller games any more because they don't spend any money on advertising in your precious 'catalogue'?

As you can tell, I am extremely annoyed, and have cancelled my regular order of CRASH. I shall from now on flick through it if I see it on a shop shelf, and only buy it if I see anything of interest, which I doubt.

£1.95 for the January edition, what a rip-off!!

Peter Hoar, Stanford-Le-Hope, Essex

It's very tempting not to bother replying to someone so determined to be cynical that they see dirty deeds in every corner.

I don't know what you mean by our 'catalogue', Peter – nor do I know what you expect to be seasonal in a Christmas Special. The point is it's a bigger magazine than normal to read over the Christmas holidays.

And if you think we Smashed Ocean games to keep them advertising, perhaps you should talk to our advertising department, which has several times had major advertisers take their business away from CRASH because the reviewers refused to be swayed by the importance of a big firm.

Your point about small adventure houses is valid, and there'll be occasional roundups of budget and mail-order adventures from now on. But I gather the policy is that full-price games are more important to review because people risk more money when they buy them.

Why do you think the CRASH reviewers are only fans of arcade games? After all, Derek Brewster writes arcade games (and he's left CRASH to produce more at his own new software house, Zeppelin).

The Christmas Special was published on December 17, not December 10, and the promise of December 10 in the magazine was simply a mistake in our production department – the printing date had been changed but they'd forgot to tell the editorial people! So that was our mistake, but hardly a plot to do you out of £1.95.

I'm giving you this issue's special Letter Of The Month prize – £50 worth of software – not to woo you back to buying CRASH, but to disprove your first paragraph. Though no doubt you'll make a conspiracy theory out of it.

LM

SHOW ME MORE

Dear Lloyd
I am writing about the venues of the Microfair and The *PCW* Show. 99.9% of all the computer shows are in London – I would accept this if there were no other venues to go to but there are. The G-Mex Centre in Manchester is big enough to hold any of the shows. I wish the show's organisers would think of people in the north as well as just the south all the time. The people in the north do have computers, you know!

The cost for me, my mum and dad is around £36 to get to London. I'm sure I'm talking for other people as well.

The shows are excellent though, if you can make them, especially The *PCW* Show – it has everything.

Also, on a different subject, what's happened to the 128-version box on CRASH reviews? Let's have it back eh? *Match Day II* had 128 music but you didn't mention it, so did *Joe Blade* and *Renegade* to name a few. Please include this box again as most 128K music is fab!

By the way, I think the video reviews are great.

Stephen Hanstead, Wigan

I agree – it's funny that though the software world is very decentralised, with lots of software houses outside London and based in Birmingham, Manchester etc (though not Scotland), and the users apparently spread evenly all over the country (judging from the post we get at the Towers), everything's in London!

To be fair, the Which? Computer Show *was held at Birmingham's National Exhibition Centre just a* ►



few weeks ago, though it's mainly for 'serious' and business computing.

128 box? I think the idea was that often there's not enough to say about the 128K version of a game except that the music is better, which is predictable.

LM

REVOLUTION CANCELLED DUE TO LACK OF SUPPORT

Dear Lloyd

Having recently read a rival magazine (*C&VG*), which I shiver to admit, I noticed a little article on one of their pages about CRASH (and ZZAP!) starting to go downhill because of 8-bit users moving up to 16-bit as it is the only place to go. So does this mean you will be slowly bringing in arcade games, reviews on Amiga and Atari as well as Speccy 128, or will you just slog on till the Spectrum 8-bit dies out? I admit it may be some time, but doesn't time fly when you're getting old!

Moving on to a brighter note I have to congratulate you and the team for, in my opinion, the best computer mag around (by the way the length of reviews is fine, but maybe a few more hints and tips).

Patrick Taylor, Chester

16-bit is only 'the only place to go' in the sense that the Apricot Xi I'm trying out is the only place to go from a battered but reliable Hermes. True, it wouldn't make much sense for a computer tyro to buy a Spectrum now – though the +2 is still one of the cheapest routes to quality computing for younger users – but the presence of 16-bit machines doesn't make the 8-bit Spectrum any less valuable for those who already have it.

Why should all those Spectrum-owners who've valued their machines for four years suddenly lose interest just because there more powerful computers such as the Amiga and ST are cheaper now?

And indeed all the signs are that the 16-bit and console 'revolutions' have only really been minor disturbances – some of the avid trade-watchers at CRASH tell me there are only about 130,000 Amigas and STs in the country, compared with some four million Spectrums, and fewer than 20,000 dedicated consoles.

It's a bit like the 'desktop publishing' revolution – last year we were all told how the face of publishing would be transformed by page-design and typesetting software, but it simply . . . hasn't happened.

So the answer is no, CRASH won't become a 16-bit magazine, though I'm sure there'll be some coverage of the 16-bit machines in news. Believe it or not CRASH's circulation has actually RISEN dramatically in the last six months, so we don't see any need to jump on bandwagons – the old family car will do us fine.

LM

SHURELY SHOME MYSTIC

Dear Lloyd

I hereby stake my claim as the first person to complete Mike Singleton's *Dark Sceptre*. I completed it on January 5 1988 at 4.50pm. A reaper I recruited killed Umbrarg's Reaper at Wimball's Way on the 22nd day and took the Dark Sceptre. After completion the end sequence is an endless stream of Warriors walking across the completion message from right to left. The message is:

The evil has failed
Of the Sceptre Dark
Your Victory to hail
In triumph we march

By the way, whatever happened to having to destroy the Dark Sceptre as written in the instructions? A handy tip is to get rid of most of the Mystics quickly, grab anything and bribe anyone. The Dark Sceptre is usually somewhere on the bottom right of the map.

Scott G MacIntyre, Argyll

Well done, but whatever happened to English poetry?

LM

CRASHING *STARGLIDER*

Dear Lloyd

I have been a Spectrum-owner since 1983 and recently decided to 'upgrade' to a +2. I then decided I would like to have some software which would make full use of the increased capabilities of my 'new' machine, and after reading some back issues of CRASH, I decided that the 128K *Starglider* seemed to be the best choice.

I bought the game and think it's brilliant, but I do have one unusual problem with it – every time I try to enter upper-case letters into the high-score table the program crashes! This is particularly unfortunate as the cheat mode you printed for it a few issues ago requires the use of upper-case letters for it to work!

I now wonder if anyone else has had this problem, or is there something wrong with my machine? Also, do you know of any POKE which would enable the cheat mode without having to use the high-score table?

Michael Barrett, Leeds

Ben suggests you try playing it in 48K mode, and I've begged Nick Roberts to see if he can print some help in the next few issues.

LM

USING HIS LLOYD MATTER . . .

Dear Lloyd

Is this another first for CRASH – a letter from far-off Hong Kong? When I was in England, I contemplated sending you a letter many times, but I never seemed to get round to it. But I've found a bit of spare time, so I thought I'd contribute to that pile of letters that threaten to take over CRASH Towers!

In England, I remember reading a letter from someone in Australia who was complaining that they received CRASH about three months late. What a terrible prospect, I thought! Now, look what's happened – it's the same thing for me. Actually, I have just received the December edition of CRASH (now being January 8) yesterday. Are all the special offers out of date? The Mail Order Minion is certainly in a festive mood, with all these special offers on games – but do they still apply to unfortunates such as me?

To make matters worse as regards the time delay, a friend in England keeps sending letters (air mail – five days) telling me all about the UP-TO-DATE CRASH! Infuriating!!

Still, there's still the panic letter-box-opening ritual, just before I'm due to receive the now-famous plastic bag containing the goodies! The wait is worth it, too.



Contrary to several readers' opinions over the last few months, CRASH is not going downhill. I thought the CRASH Sampler idea was excellent – but PLEASE don't repeat the 3-D glasses bit to often, as certain members of the family are experts at throwing away essential items that look like rubbish!

Though the power supply in this place is 200-220 volts, the Spectrum 128K works fine – which is a great relief! Unfortunately, my games input has drastically fallen since arriving in Hong Kong. There's only one shop that has even HEARD of the Speccy – and the latest game they stock is Quicksilva's *Glass*!! What they do sell, though, is microdrive cartridges, a rarity in the UK. They are rather expensive though.

Back to more mundane matters, your reviewing system has just about reached top standard, but can you please state specifically in the SOUND comment whether or not there is any 128 sound - no matter how insignificant. It can make quite a difference (especially if Binary Design have got anything to do with it!).

Next comment: what's wrong with budget games? Some are good, some not so good. But, if a software company or programmer wants to make a name for itself/himself something like *Driller* is going to have MUCH more impact than, say, *I, Ball 2* simply because the latter project has neither the time nor the money to produce a high-quality product (not just the game, but the packaging and even the advertising). And, as soon as a company starts churning out thousands of budget titles, the majority will not even be worth the tape they're saved on! Just think of some recent classics: *Driller*, *The Sentinel*, *Exolon*, *Zynaps* etc . . . it takes some thinking till you come up with a budget classic.

ARC Britton, Hong Kong

PS Did you ever know that 'Lloyd' means 'grey'? You do now!

PPS Whatever happened to the habitually-mentioned LMLWD? Is everyone becoming nescient (LMLWD)?!

It's not that I've been abrogating my lexicographical mandate, it's just that my philanthropism is quotidian and the task of deforesting my Augean in-tray incontrovertibly Sisyphean – hence horary workloads exacerbate latent vocabularian amnesia.

I didn't. It sounds unpromising. Why didn't they call 'grey' 'Lloyd'? Think of it: Lloydhounds, Lloyd eminence, the well-known Tarzan film Lloydstoke.

Your comment on 128 sound echoes Stephen Hanstead's letter, so the message has probably got across. But as for budget games, why do we want so many classics?! There wouldn't seem to me to be anything wrong with a simple, undistinguished but fun game – and that's perfect for a £2-3 price.

Also, it's not only a question of how much software houses can invest in a project – it's also a matter of how much they can ask for the product. It's commercial idiocy to sell a great great game for £2.99 when you could get three times that for it.

And, like it or not, the software business IS a business – nobody's in it for love. A software house should give you good value for money, as a magazine tries to, and cheap deceit is wrong whatever the motivation. But there's nothing wrong – at least, I think there's nothing wrong and I suspect even the loudest Spectrum socialist would agree with me if they stooped to rationality – with trying to make a bit of money, as long as you're honest about it.

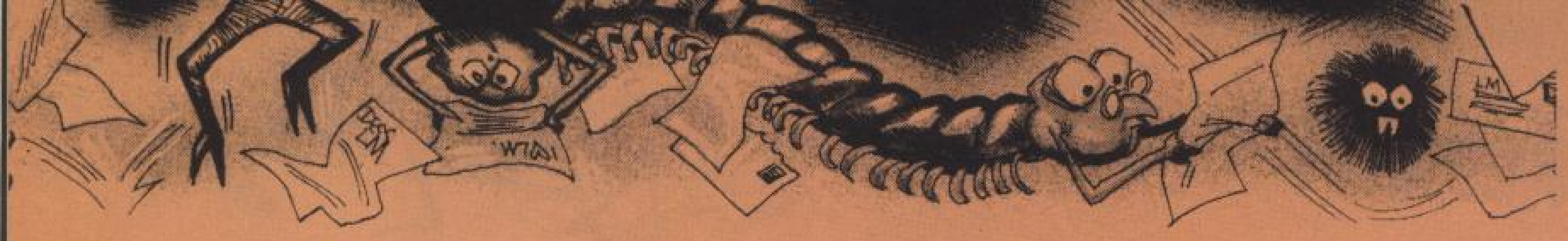
LM

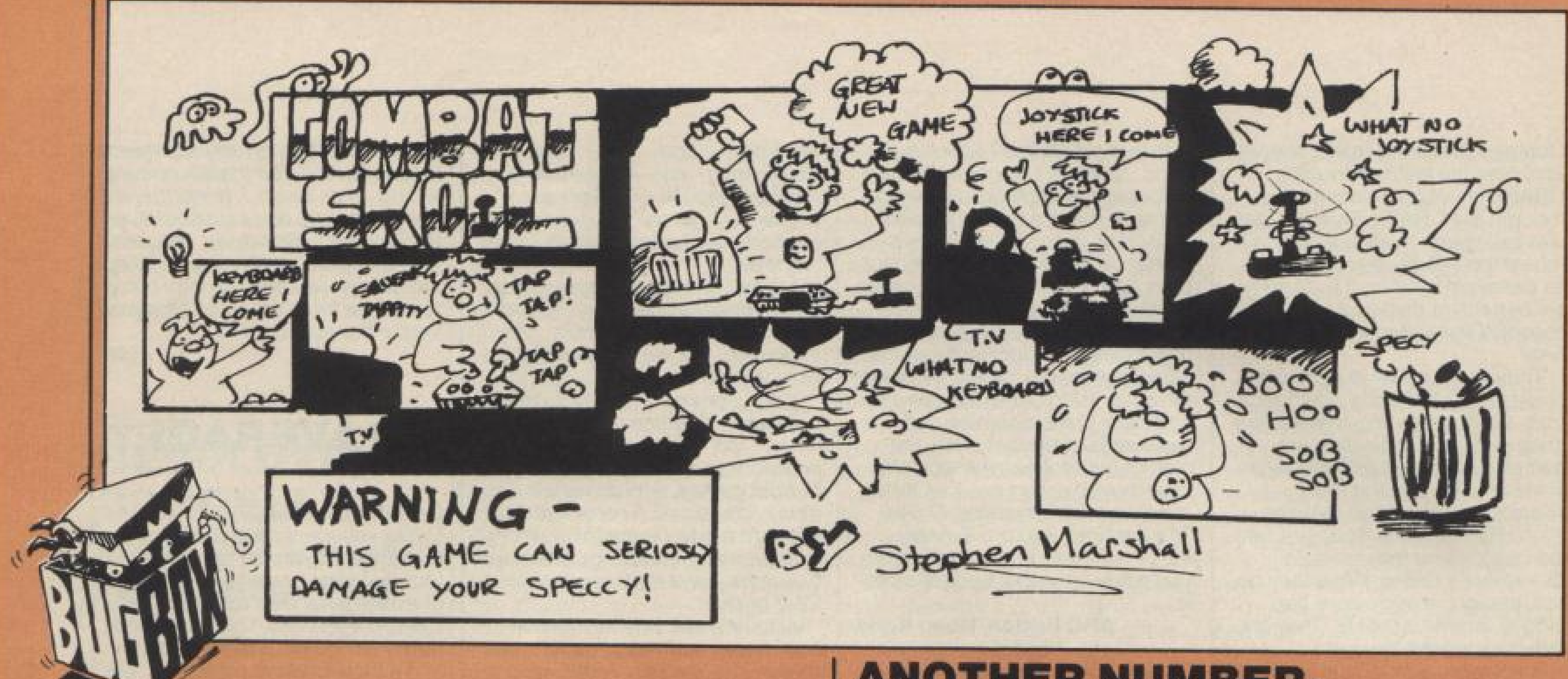
MR AVERAGE?

Dear Lloyd
Could you mention in the Forum that an (anonymous) reader has found out the average percentage of every game ever reviewed in CRASH – 68.28%. This was found out by using The CRASH Directory and a (now broken) calculator. Marks out of ten in the Adventure Trail I multiplied by ten to get a percentage (eg 7/10 becomes 70%).

The Big Ugly Green Monster From Ludlow

Hello Nick, you're looking very green today! But thanks for your





number-crunching, whoever you are – I suppose ideally the average percentage should be a little lower, 50-60%, because an average of almost 70% suggests we've been rating average games as above-average. One statistical explanation might be that (quite) often games score in the high 90s, but under 10% is virtually unheard of.

LM

ANOTHER NUMBER-CRUNCHER

Dear Lloyd
I do not think that the general standards of games are improving. I did a little research recently to find out whether full-price games are generally better than budget games or not.

I borrowed my mum's trusty calculator, added up the overall ratings of the games that were between £7 and £10, and divided by the number of games in that price range. I repeated the process for budget games and the only game above a tenner, a strategy game.

I did this in the Christmas Special. I repeated the process for Issue 45. I also worked out the values of the compilations in both issues. These are my results:

	Issue 45	Issue 48
BUDGET	62.7%	52.9%
FULL-PRICE	65.4%	60.8%
HORRENDOUSLY OVERPRICED	78%	
COMPILATIONS	78.8%	78.7%

Nicholas Jeffery, Brighton

True enough, the average percentages in both budget and full-price categories are lower in Issue 48. But as every statistician knows a couple of figures don't tell the full story – particularly when they're averages, because a few freak high or low ratings can distort the average.

Issue 45 had three Smashes, Wizball, Bubble Bobble *and* I, Ball 2 *while Issue 48 had only two,* Combat School *and* Match Day II. *Mind you, the lowest in Issue 48* Saracen *got a miserable 15% while the lowest in Issue 45 was even worse – 12% for* Heist 2012! *(And* Football Director *got 13%.)*

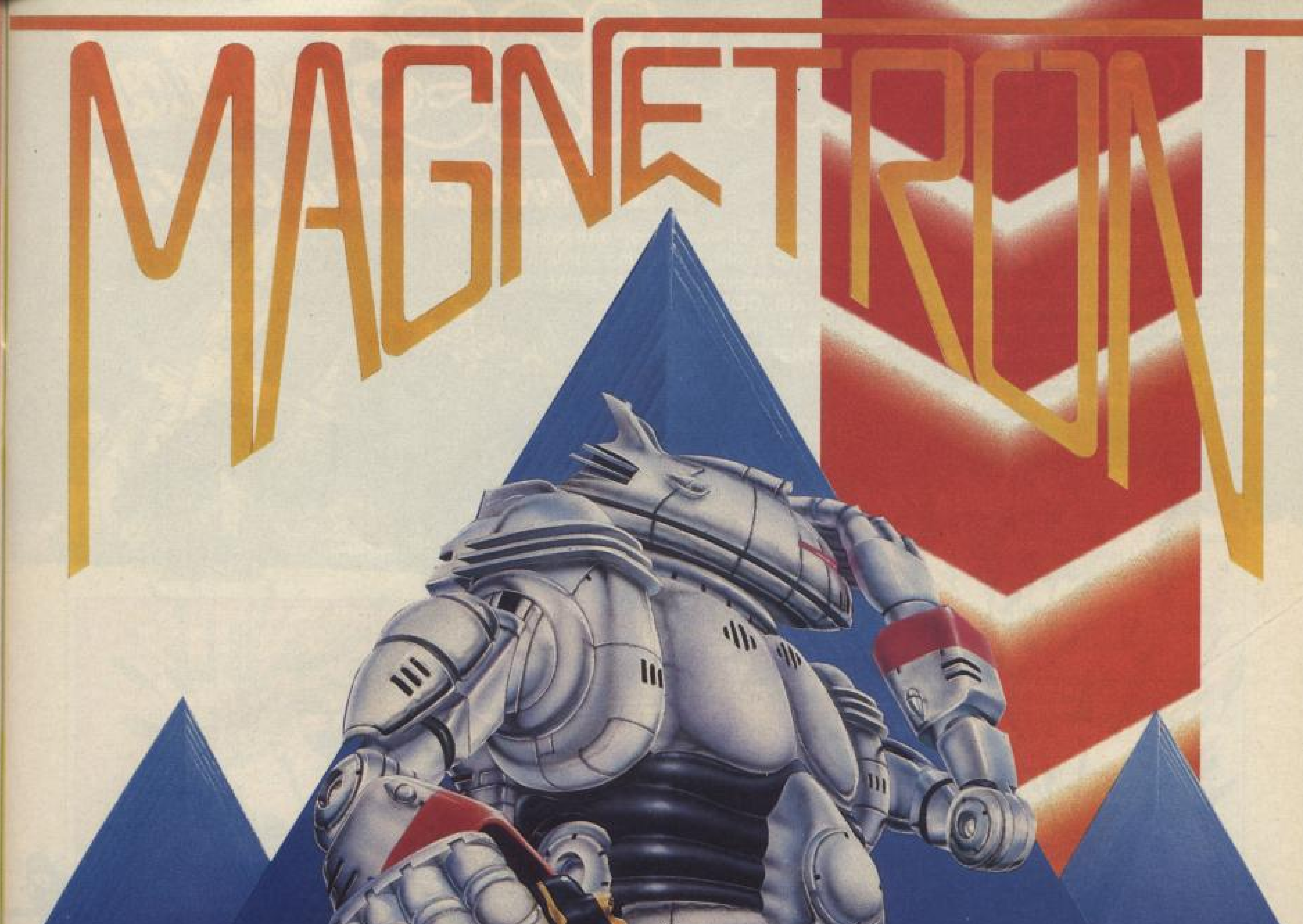
What your averages do indicate a bit more reliably is that budget games as a race aren't much inferior to full-price games.

By the way, for advice on +2 music programs write to Jon Bates.

LM

Crunch some numbers, puncture some fond illusions, give me an excuse to abandon the word processor for a typewriter where you can see what you're doing . . . whatever your views are, on CRASH, software, Smashing Match Day **or anything less important, write to:**

Lloyd Mangram
CRASH Forum
PO Box 10
Ludlow
Shropshire SY8 1DB



Get to Grips with Magnetron

Fully repaired and recharged after his exploits in Quazatron, KLP-2, that wayward Meknotech of Steve Turner's creation, is back in MAGNETRON. His destination, the space platforms of Quarteck. His mission, to locate and shut down the main reactors.

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Screen shots from Spectrum version.

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Nick Roberts'

PLAYING TIPS



NUMBER 50

It's the golden issue of CRASH so I've got some golden tips and some really sparkling maps – of new games which no other mag has mapped! There's stylish *cat*ography for The Edge's Smashed new licence Garfield In Big, Fat, Hairy Deal, plus the solution to the game (who said tipsters were slow at completing games?).

Then there's the winner of the Driller map comp, who's so good with geography he forgot to leave his address; a more down-to-earth bit of map'n'tipping for Andy Capp; and an early map for section one of Platoon.

And in reply to all the pleas for tips and POKEs for older games there's a brand new section crammed full of golden oldies – it's called Flashback. AND of course there's the usual Cheat Mode Motel and the Tipster and Cartographer Of The Month awards, both increased to £50 for this month with golden generosity.

So ready, steady, go and get them POKEs!

PLEXAR PLEASURE

I love M.A.D.'s Plexar **– it was one of the best budget titles of 1987. And now the** Codebusters **have hacked it to make motoring down those crystal roads even more addictive.**

```
10 REM PLEXAR
20 REM BY THE CODEBUSTERS
30 REM FOR CRASH MAGAZINE
40 PRINT AT 10,10;"LOAD PLEXAR";
   AT 11,9;"FROM THE START":
   LOAD "" CODE
50 LET X=37329: POKE X,195
60 POKE X+1,0: POKE X+2,98
70 FOR F=25088 TO 25094: READ A:
   POKE F,A: NEXT F
80 DATA 175,50,138,186,195
90 DATA 136,144
100 RANDOMIZE USR 37263
```

HEIST 2012 HACKED

I don't know why anyone would want to hack Firebird's dismal 12% game, but the Cairnpoke **crazies have – so here it is.**

```
10 CLEAR 25999
15 PRINT AT 10,4;"POKES BY CAIRNPOKE
   1987": LOAD ""CODE
20 POKE 36106,201: REM INFINITE ENERGY
30 POKE 36190,201: POKE 36858,201: REM
   FALL ANY HEIGHT
40 RANDOMIZE USR 32766
```

1440°

David Brennan **of Fife has temporarily hung up his skateboard to zoom through some tips for US Gold's** 720° **. . . here's how equipment helps.**

Skateboard: a new board is lighter and allows you to do more turns in midair. And with a new board you get 700 points for a turn instead of 400.

Pads and helmet: when knocked off your board you get up quicker.

Shoes: you can kick faster (handy – or footy – against killer bees!)

IN THE BASKET

Dynamic Andrew Jackson **of Peterborough sent in these tips for Ocean's** Basket Master**, programmed by Dinamics.**

1 Try to go for three-point shots as the computer will usually go for two-point shots.

2 Try to commit as few fouls as possible as the computer will nearly always get the foul shots in.

3 Keep energy high at all times so you can perform dunk shots and outrun the computer.

4 Try not to travel back court or you will loose control of the ball.

5 Try to basket all foul shots for extra points. ▶

THE CAIRNPOKE COLLECTION

This is getting to be a regular spot – the Cairnpoke POKEsters send in page after page of computer paper covered in POKEs for Multiface and normal use. And it pays off, because they're this month's winners of £50 of software!

BOSCONIAN
INFINITE LIVES, FUEL AND BOMBS

```
10  CLEAR 25599
15  PRINT AT 10,4;"POKES BY CAIRNPOKE
    1987": LOAD ""CODE 16384
20  POKE 23739,82: POKE 23740,0
30  LOAD ""CODE 25600: LOAD ""CODE
    32765
40  POKE 33356,0: REM INFINITE LIVES
50  POKE 38595,0: REM INFINITE FUEL
60  POKE 36121,0: REM INFINITE BOMBS
70  RANDOMIZE USR 32765
```

CAR WARS
INFINITE LIVES

```
10  CLEAR 24999
15  PRINT AT 10,4;"POKES BY CAIRNPOKE
    1987": LOAD ""CODE
20  LOAD ""CODE
30  POKE 32337,0
40  RANDOMIZE USR 57090
```

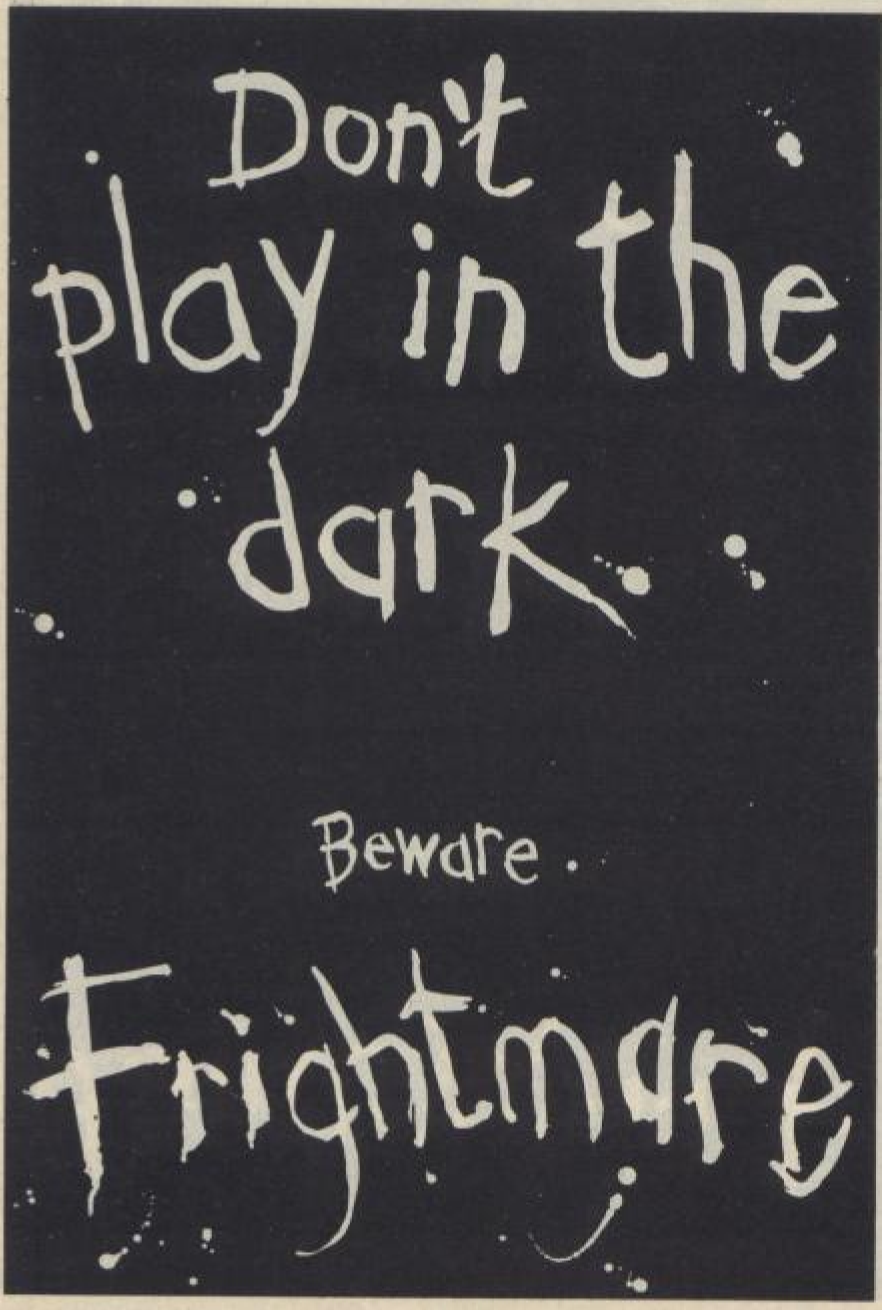
DEATH OR GLORY
INFINITE FUEL AND SHIELDS

```
10  CLEAR 24231
15  PRINT AT 10,4;"POKE BY CAIRNPOKE
    1987": LOAD ""SCREEN$
20  LOAD""CODE
30  POKE 37788,201: POKE 37912,201
40  POKE 38117,201: POKE 38189,201
50  RANDOMIZE USR 33664
```

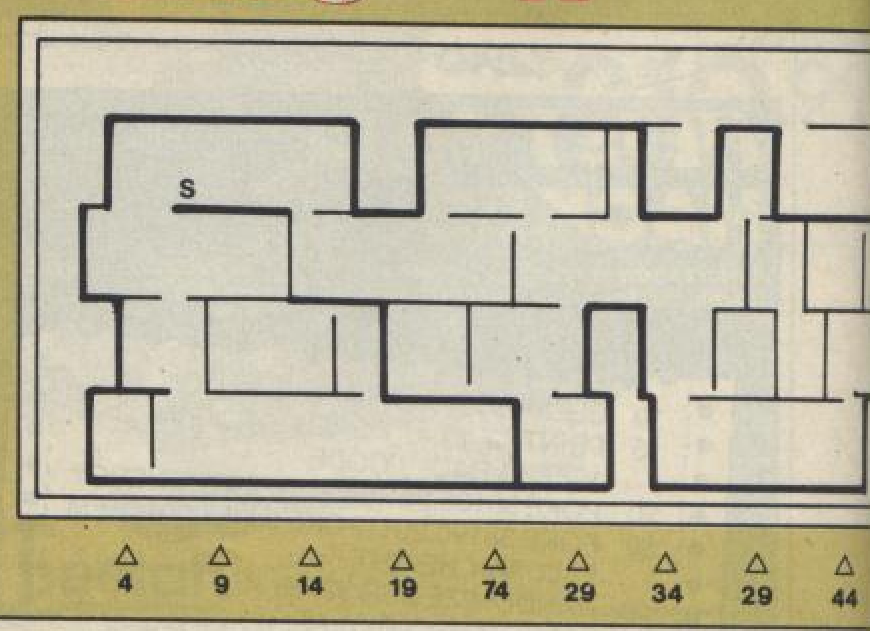
ORBIX THE TERRORBALL
INFINITE LIVES

```
10  CLEAR 65520
15  MERGE "": PRINT AT 10,4;"POKE BY
    CAIRNPOKE 1987"
20  FOR C=65523 TO 65535
30  POKE C,PEEK (C-41760): NEXT C
40  POKE 65529,191
50  RANDOMIZE USR 65523
```

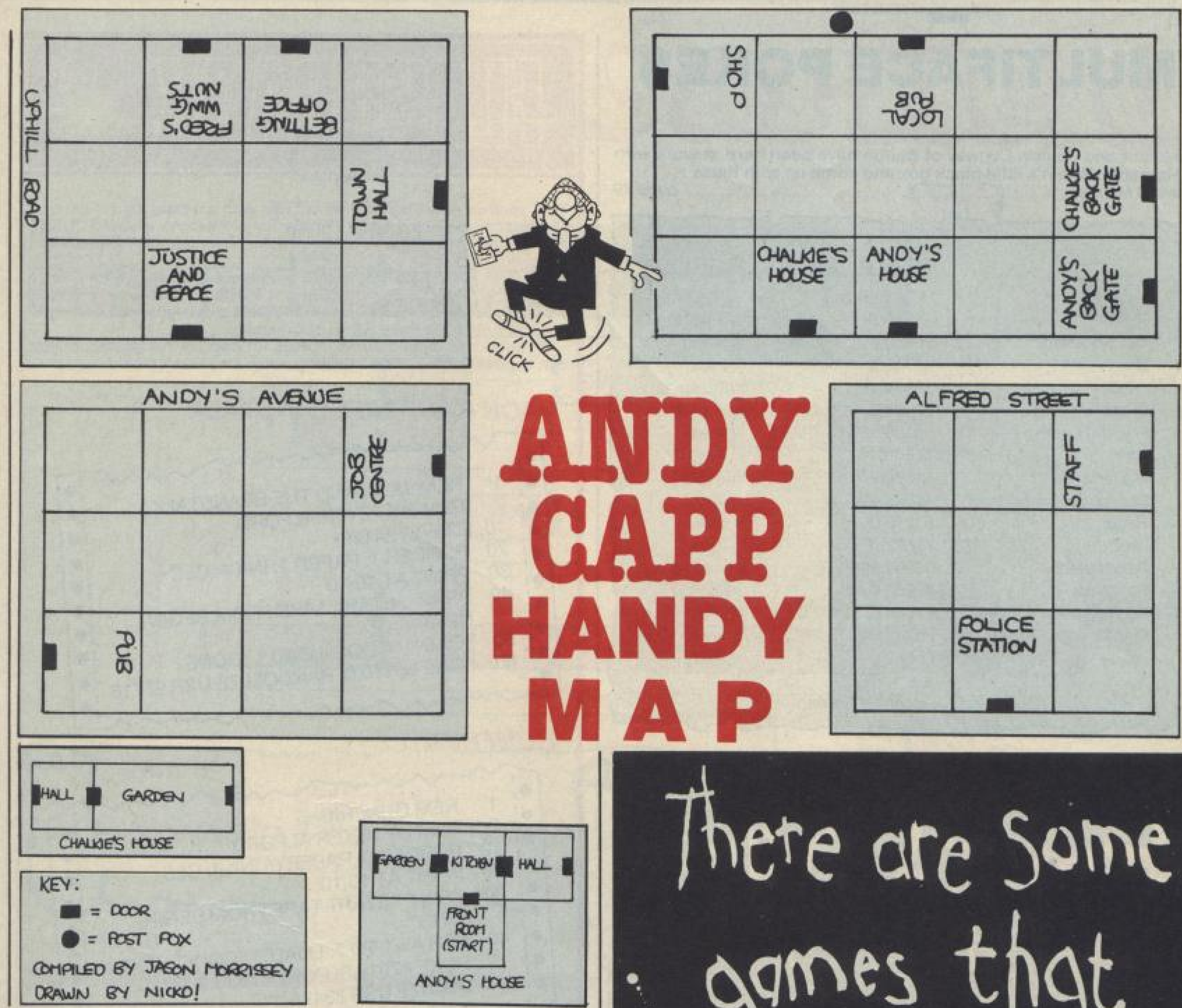
After loading type POKE 32188,0, then RANDOMIZE USR 36560.

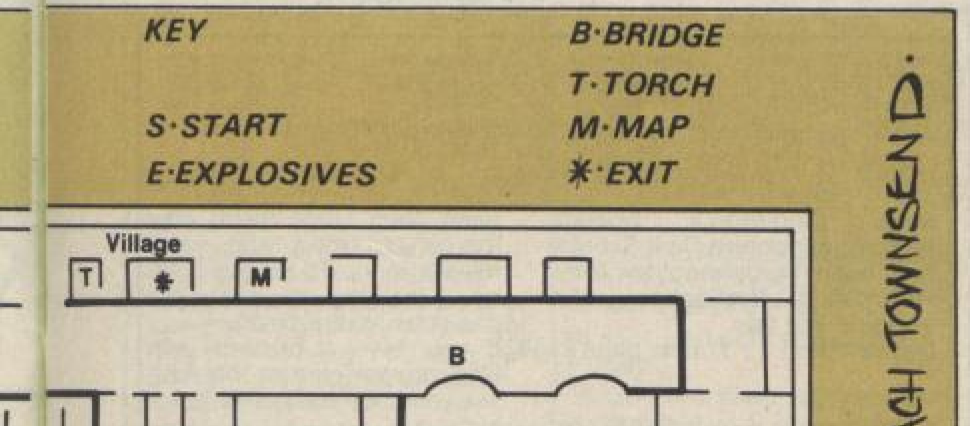


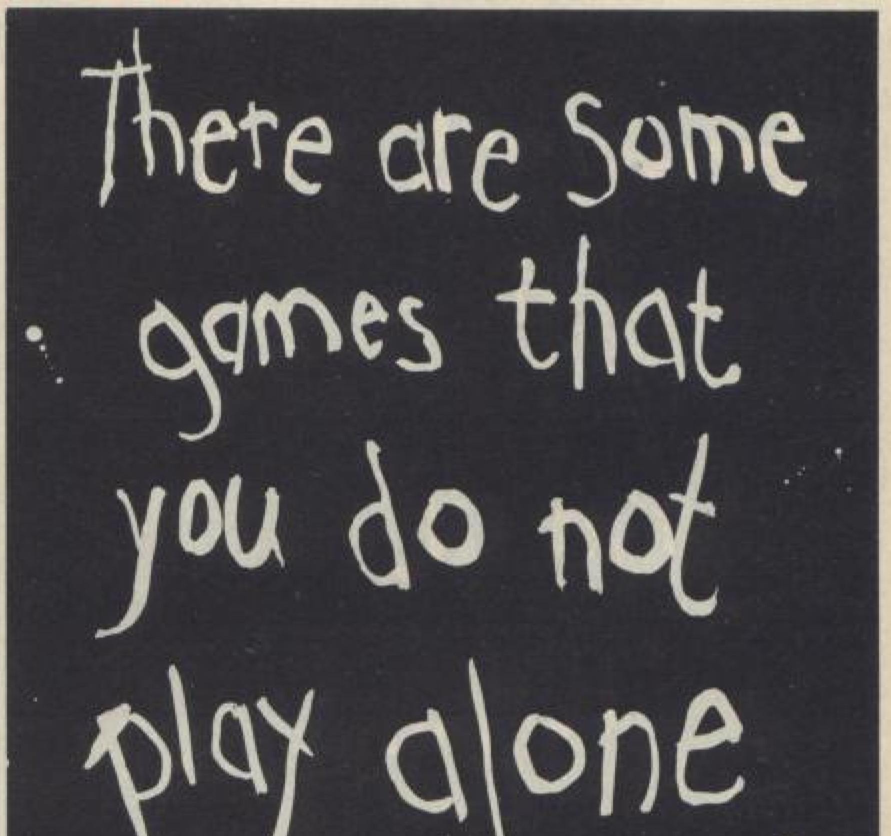
PLATOON



ANDY CAPP HANDY MAP







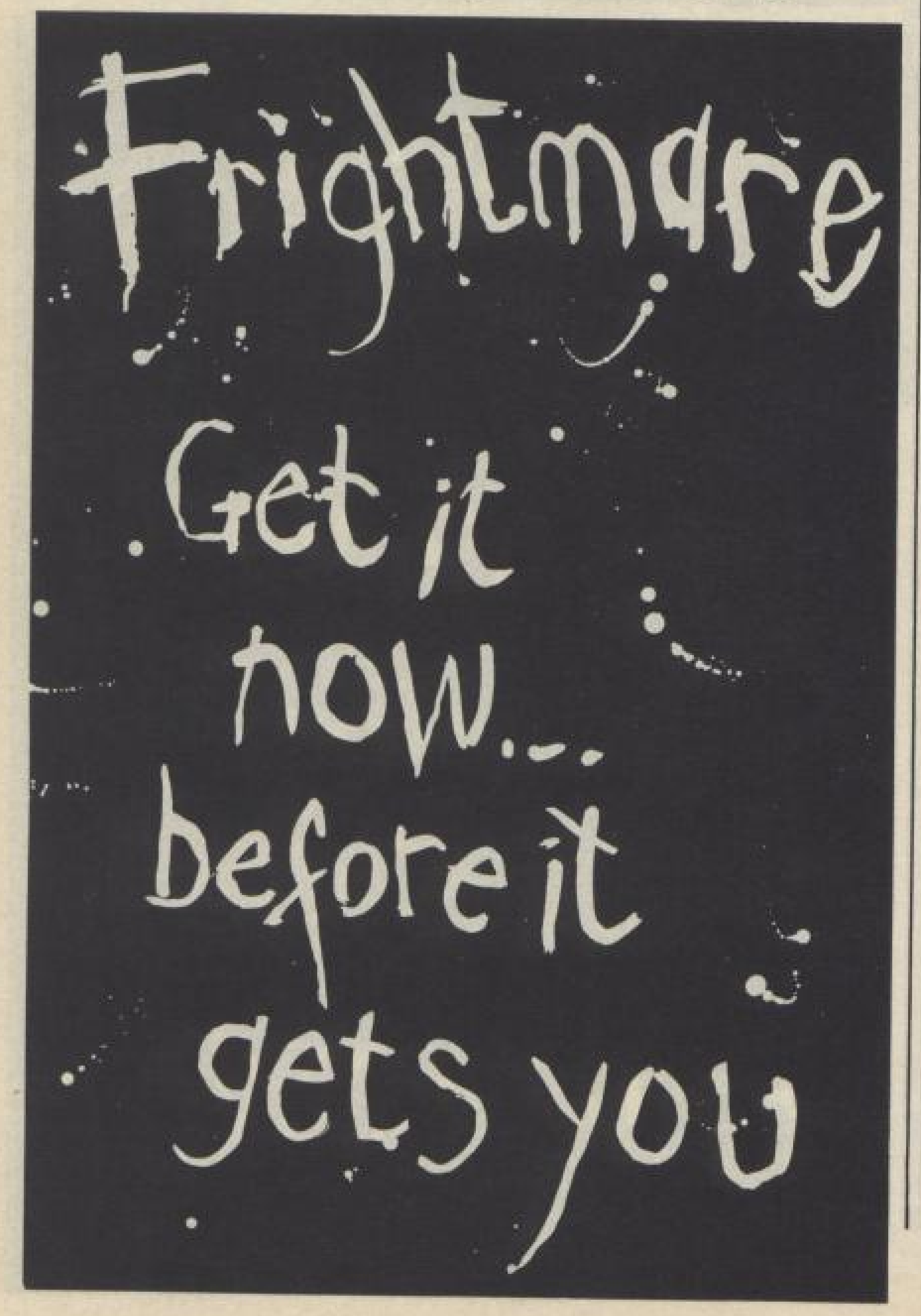
MULTIFACE POKES

Marcus and Damian Conway **of Bolton have been hard at work with Romantic Robot's little black box and come up with these . . .**

win a Multiface .... *page 49*

	POKE	RESULT
720°	41918,0	∞ time
ATV Simulator	60250,0	∞ time
Dizzy	62746,0	∞ lives
and	59644,1	turbo speed!
Dustin	52904,0	invincible
Freddy Hardest	63396,18 & 63792,18	∞ lives
and	61606,4	∞ lives
Hysteria	44588,201	invincible
Renegade	41048,195	∞ lives
Rygar	51216,0	∞ time
and	61577,0	∞ lives
Salamander	38902,201	invincible
Star Wars	45268,0	invincible
Thundercats	31401,0: 31402,0	∞ lives
Trantor	56711,0	∞ time
and	52529,0	∞ energy

∞ denotes 'infinite'



FLASHBACK

Yes, another new Playing Tips section with a trendy logo is born. In Flashback you'll find fresh POKEs for old games and old POKEs reprinted, some of them from the issues no longer available as back numbers.

To start Flashback off, here's an infinite-lives POKE for Thor's 1984 Jack And The Beanstalk, **and a POKE that stops the bandit drawing during the quickdraw in Ultimate's two-year-old** Gunfright. **They're both from** Peter Alford **of Coventry.**

If you've discovered some POKEs for popular old games, or you can suggest which need POKEing, flash into Flashback!

JACK AND THE BEANSTALK

```
1  REM JACK AND THE BEANSTALK
2  REM BY PETER ALFORD
10 CLEAR 24139
20 BORDER 1: PAPER 1: INK 4: CLS
30 PRINT AT 10,10
40 PRINT "START TAPE FROM BEGIN-
   NING"
50 LOAD ""CODE: LOAD ""CODE
60 POKE 56110,0: RANDOMIZE USR 27716
```

GUNFRIGHT

```
1  REM GUNFRIGHT
2  REM BY PETER ALFORD
10 BORDER 0: PAPER 0: INK 4: CLS
20 PRINT AT 10,10
30 PRINT "START TAPE FROM BEGIN-
   NING"
40 FOR A=1 TO 7: LOAD "" CODE: NEXT A:
   POKE 47919,0: POKE 47920,0: RAN-
   DOMIZE USR 23424
```

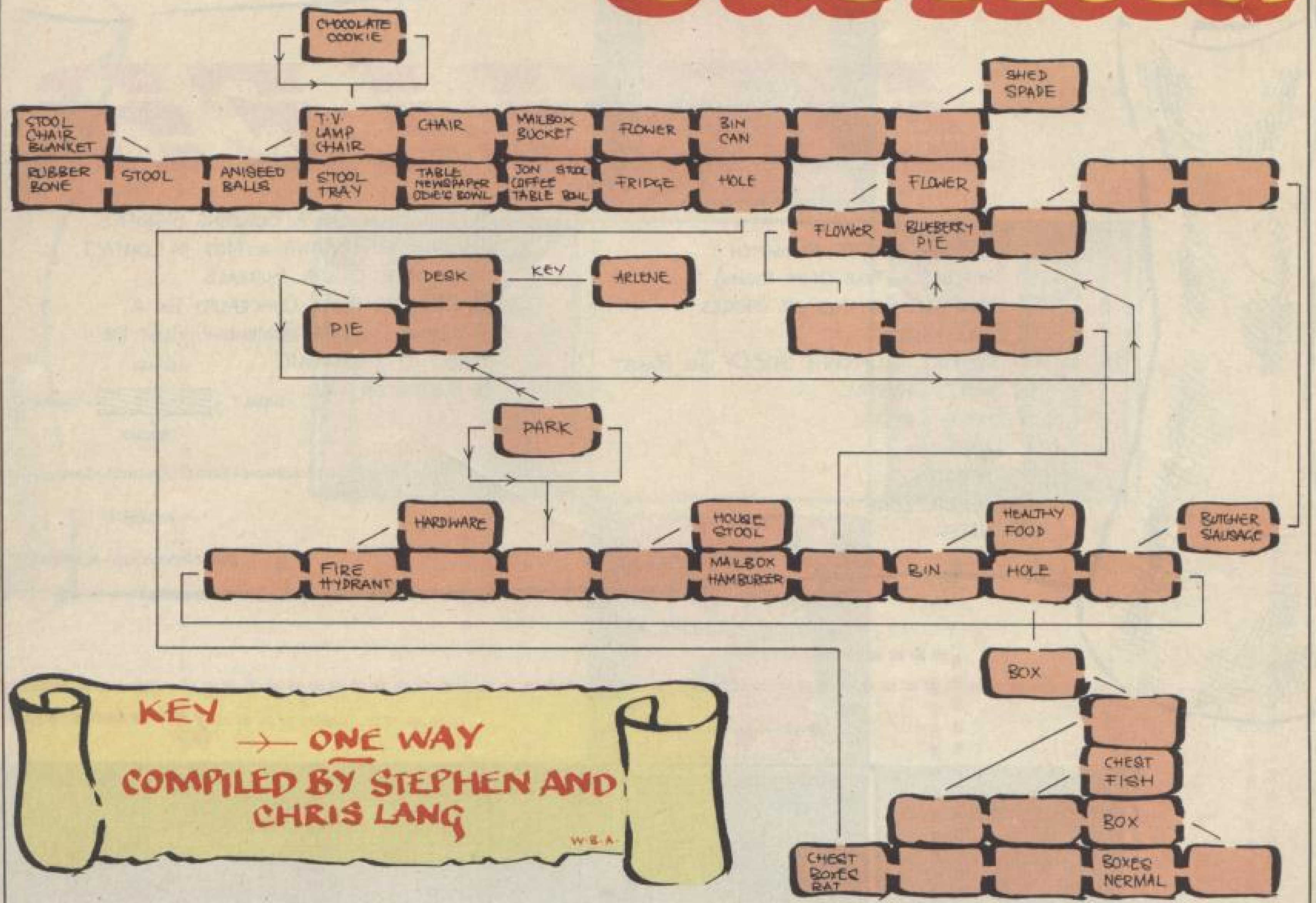
THE TIP OF THE *DARK SCEPTRE*

Mike Singleton's brilliant Firebird adventure Dark Sceptre **has been completed by** Miles Holbrook **of Nottingham, who brings these tips.**

first to finish? .... Forum, page 31

1. Your mystic is by far your most useful character. Without him your mission becomes much harder, so I'd advise starting again if he's killed.
2. Don't bother trying to find the Dark Sceptre till you have most of the surviving warriors on your side.
3. The most important people to recruit are other mystics, for the reason above, and enemy kings – some of these are the best fighters in the game.
4. Put all your characters apart from the mystic on persuade, befriend or challenge missions.
5. The best way to convert people is to get the mystic to petrify them, then curse them. After this charm them and finally release them. To do this it will be necessary to pass the character several times.
6. If you have a problem with Umbrarg's mystic at the start, set your two assassins to kill him.
7. As soon as you get extra kings or mystics on your side, save the game.
8. Don't worry if you lose large numbers of lesser characters.
9. When you have the majority of surviving warriors on your side, save the game and try to grab the Dark Sceptre. If you have problems with enemies, reload your position and send a mystic to convert them or curse them. When you find the Dark Sceptre and its guardian, either use one of the good kings to kill him or curse him with a mystic. (It ends up at the bottom in the middle of the map.)

Garfield



FAST WORKING – AND WINNING!

Cartographers Of The Month Stephen and Chris Lang **don't waste time when it comes to completing games – they've got this** Garfield's Big, Fat, Hairy Deal **solution and map in the same issue as the Smash review (page 18)! (And they'll find a few more games to complete in the £50 worth of software that they'll be receiving soon.)**

SOLUTION
(Don't read this if you want to do it yourself!)

1 Go right till Garfield falls down a **hole**.
2 Walk to the far left of the **chest** and kick it. Quickly pick up the **key**, before the **rat** eats it!
3 Go to the **park** and drop the **key**.
4 Go to the **shed** and pick up the **spade**.
5 Go to the **hardware shop** and use the **spade**. Then pick up the **money**.
6 Go to the **Healthy Food Shop**. Drop the **money** and some **seeds** will appear. Pick up the **seeds**.
7 Go to the **park** and drop the **seeds**, then pick up the **key**. Afterwards, jump up at the **bird**.
8 When in the **room** where the bird left you, go up. Then go right to meet **Arlene**.

TIPS
(Read this if you're stuck!)

- If you're about to have a **snack attack**, drop essential items, pick up any object which is not needed, and EAT IT!
- If you're about to **go to sleep**, either drink Jon's coffee, or stop and rest while kicking Odie.

EXTRA POINTS
(Read this if you're GREEDY!)

- Go to the chair next to the TV, jump onto the chair and kick to rip it.
- Go to every room.
- Pick up every object.
- Eat most of the food (save some for when you get hungry), and eat objects which aren't needed in the game.
- Place the tin behind the bin in the same room.
- Take the light to the sewers.
- Kick Odie and Nermal whenever possible.

THRILLER WINNER

Well, what an impressive way to start off a new comp series in Playing Tips – the maps tray has been swamped by 11 plans of Incentive's Driller**, all entries for the Christmas Special map competition!**

The winner is Victor Lush, **who sent in this map and tips – but in the great tradition of all competitions, Victor cannot be with us this month. He forgot to include his address with his entry (or I've lost it!). Please send in your address and phone number, Victor, so that I can contact you and get your prizes to you as soon as possible.**

For some reason no-one who entered the competition could get to sector 18. Is it possible? Or has Incentive made a programming mistake? Write and let us know.

DRILLER

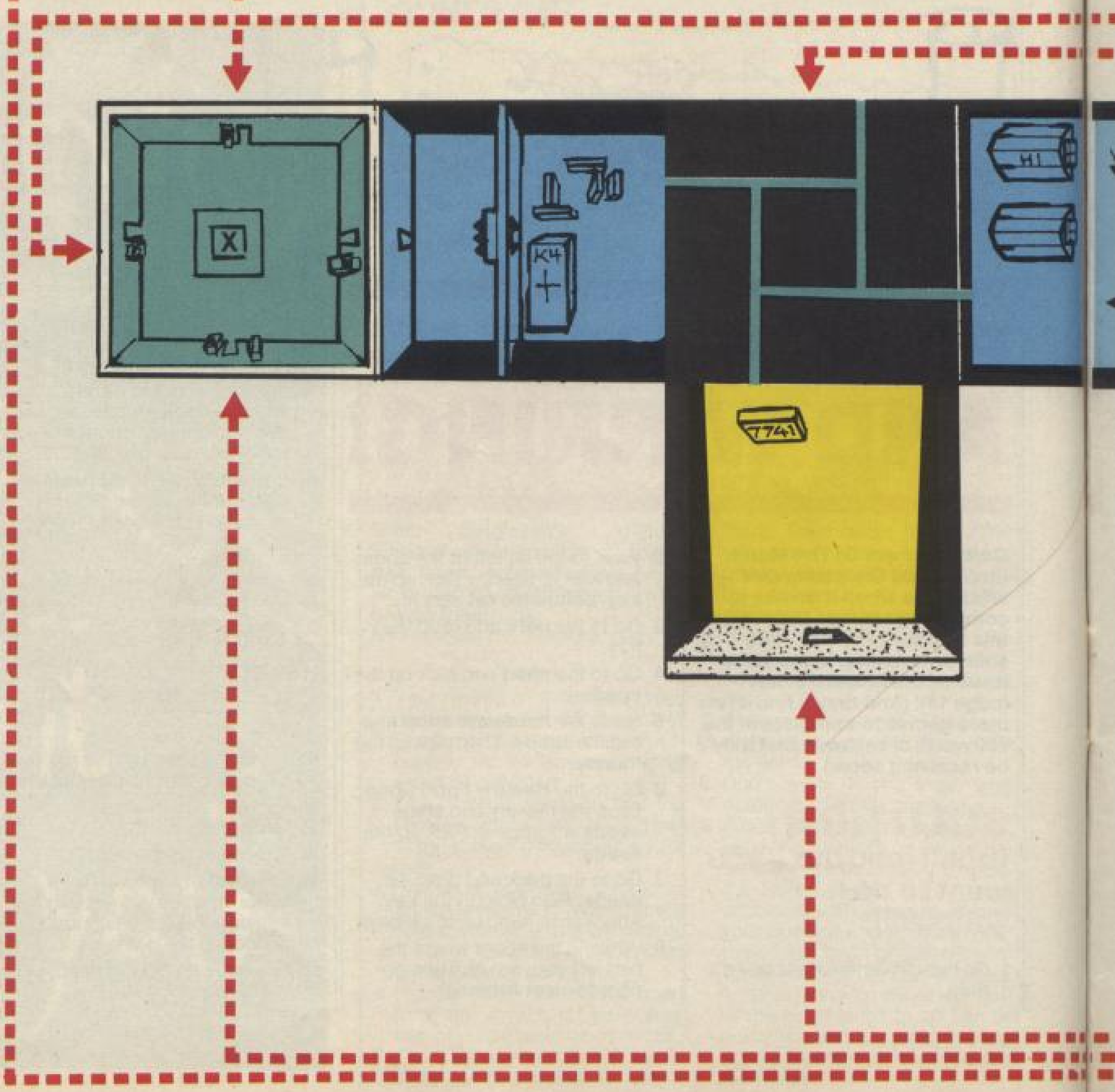
KEY
- SWITCHED ON/OFF BY SWITCH
- SWITCH (CAN TAKE OTHER FORMS)
- DOOR INTO COMPLEX OR STORES
- X DRILL HERE
- T TELEPORT TO OPPOSITE SIDE OF THE PLANET
- SHIELD CRYSTAL
- ENERY CRYSTAL
- LASER
- MINE
- DANGER ZONE
- WATER

+ THIS SIGN ON A BUILDING SIGNIFIES THAT IT IS FLOATING ie. NOT IN CONTACT WITH ANY OTHER SURFACE

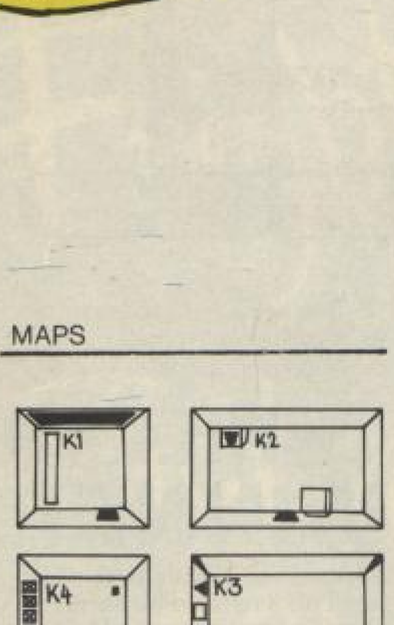
DRILLING POINT CONCEALED BY A BUILDING - WHICH SOMEHOW, MUST BE MADE TO DISSAPEAR.

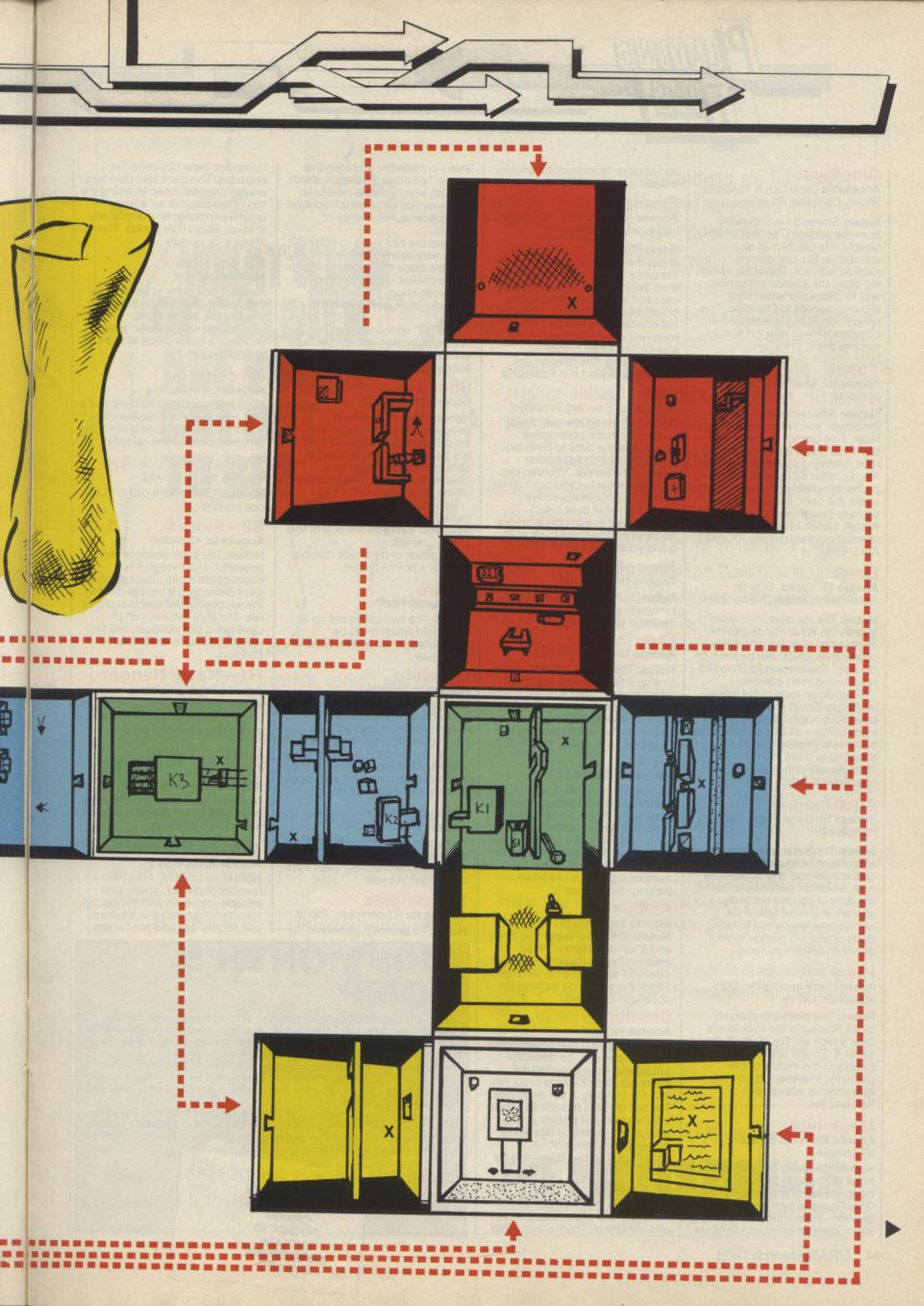
SWITCH ON WALL.

OCHRE
BASALT - GRAPHITE
OBSIDIAN
EMERALD - MALACHITC - RUBY - AQUAMARINE - BERYL - AMETHYST - LAPIS LAZULI
OPAL
NICCOLITE
QUARTZ - DIAMOND - ALABASTER



MAPS




K3
K2
K1
X

Amethyst
Access to: Lapis Lazuli, Niccolite, Topaz, Obsidian, S1 stores

Notes: Stores S1 is shootable from the outside. The well which bisects this platform is also shootable. The drill point is marked with a X. The cube switch will allow the section in the north wall to disappear when shot, allowing access to Obsidian. The teleport (to Ruby) is activated in complex K1 – to teleport simply run into the T.

Topaz
Access to: Amethyst, Beryl, K2 complex

Notes: When entering from Amethyst, you will come across a laser. This cannot be destroyed but if you shoot it it will rotate 90°, thus removing you from its line of fire. To enter K2 complex with the probe, move directly onto the slab under the door, then turn so you can see the two switches. Shoot the left switch to go up. To get down shoot the right one. DO NOT FALL OFF!

Beryl
Access to: Topaz, Quartz, Aquamarine, Basalt, K3 complex

Notes: The massive laser which guards the K3 entrance can be disabled by shooting the three power lines which can be seen on the map. The teleport (to Emerald) is activated in K1 complex.

To open up exits in the walls leading to Basalt and Aquamarine, enter K3 complex and shoot the signs on the wall. Shooting to three squares will open Aquamarine, shooting to three triangles will open Basalt; only one can be opened at a time.

Aquamarine
Access to: Beryl, Ruby, Ketar Hangar H1

Notes: The Ketar reconnaissance aircraft can be found in the hangar on the right (the only accessible one), which is opened by shooting the door. If you are not in the aircraft, you must follow the arrows precisely when entering Ruby or you will plunge to your doom on Mitral's surface.

Ruby
Access to: Aquamarine, Opal, Malachite, Ochre

Notes: The diamond-shaped block floating in the middle is a laser which will fire at you if you shoot it. To drill you must be exactly in the middle of the pathway. The teleport (to Amethyst) is activated in K1 complex.

Malachite
Access to: Ruby, Emerald, K4 complex

Notes: You need the aircraft to enter K4 through the hole at the bottom. Shoot both the eyes of the Gate Guard to turn him off, but beware – if you shoot his nose he'll shoot at you once more. His fangs and all other blocks can be shot for points.

Emerald
Access to: Malachite, Alabaster, Lapis Lazuli, Graphite

Notes: To reveal the drilling point, shoot the top crystal and run over the block underneath (which will then disappear). The lasers on the east and west have blind spots, but all are indestructible. Shooting the crystal in the middle of the room will raise your energy and shields five times before disappearing. The teleport (to Beryl) is activated in K1 complex.

Lapis Lazuli
Access to: Emerald, Amethyst

Notes: Shooting the switch will remove both the obstructive barrier and the door to Emerald. Shoot the switch again after passing the barrier. You can see over the barrier but you can't climb over it. The pyramids do not contain energy: their only functions are to add points to your score when you shoot them and to get in your way.

Niccolite
Access to: Amethyst

Notes: Running into a mine will terminate you. Shooting the switch is vital.

Quartz
Access to: Beryl

Notes: The laser is indestructible; to stop it firing at you, you must shoot the cord that is suspending it from the block above. The drill point is marked X. Shoot the switch on the wall for access to Diamond.

Opal
Access to: Diamond, Ruby

Notes: Shooting the floor in this sector will increase your shields to maximum. When the switches in Niccolite, Alabaster and Quartz have been shot, the one here and the wall will fall down, giving you access to Diamond. What the number signifies is unknown (drilling coordinates?).

Alabaster
Access to: Emerald

Notes: Shoot the water five times and it will drain away. When entering the pit, make sure you go down the stairs – it's too far to fall. Shoot the switch on the wall for access to Diamond.

Diamond
Access to: Opal

Notes: To get rid of the building so that you can drill, go down the tunnel and keep shooting the diamond. After 20 shots or so, run into the building. It will disappear. The two crystals provide an almost infinite supply of shields and energy which can be tapped by running into them (not by shooting). The two lasers can be shot.

Obsidian
Access to: Amethyst, S2 stores

Notes: The two lasers can be shot off their turrets, There are no other lasers outside the stores in this sector. To bridge the trench, shoot the slab which stands next to it. The pyramids in the trench contain bonus points, not energy or shields.

There are two ways to enter S2; one is very nearly invisible and very near the edge of the sector. If you have a choice, use the hidden one – you can shoot the extremely powerful laser inside from the back.

The '17' on the wall has no obvious function, except perhaps to inform you that there are only 17 accessible sectors.

Basalt
Access to: Beryl, U

Notes: There is no way of removing the block under which the drill point is situated. But there is a point at which a reading of 50% can be obtained, thus clearing the sector. This is marked on the map with a dot.

To access unknown complex U, move between the two L-shaped walls and walk into the end of the one on the left.

The stack of pyramids can be shot for a points bonus.

Ochre
Access to: Ruby

Notes: The two pillars set up a force field which must be negotiated (it has a blind spot) or flown over.

Graphite
Access to: Emerald

Notes: The switch seems to have no function. If you land the reconnaissance craft on the floating block, it will disappear. The acid river causes your energy to go down every move you take. You must use the path if you hope to have any chance of drilling.

K1 complex
Access to: K2 complex

Notes: To make the teleports appear, make the blocks disappear by shooting them from right to left in order.

K2 complex
Access to: K1 complex, Topaz

Notes: To enter K2, go behind the computer bank opposite the entrance. This bank also disposes energy crystals. Keep shooting the top of the bank till an energy crystal permanently materialises (it takes about four shots). Then shoot it for energy.

K3 complex
Access to: Beryl

Notes: Look out – scanners can enter here. Shooting in this room triggers the on/off signal responsible for the door: even shooting a blank piece of the wall will do this.

K4 complex
Access to: Malachite

Notes: Shoot the four lasers on the wall, which are destructible. Then shoot the block: it appears to have no effect outside the complex.

S1 – stores . . . 4,4
Access to: Amethyst

Notes: Rich in both types of Rubicon crystal.

S2 – stores . . . 1,1
Access to: Obsidian

Notes: The laser inside is very powerful, and though it's destructible it can cause an awful lot of damage. It is best to enter by the second hidden exit to avoid its fire. The light fixtures can be destroyed, but curiously will be relit when you re-enter the building.

H1 – Ketar Hangar
Access to: Aquamarine

Notes: To dock with the ship, go under it and rise. To dock with the probe go over it and fall.

U – Unknown Complex
Access to: Basalt

Notes: If you follow this passage you'll find a switch which doesn't seem to do anything.

Mitral – the moon
Access to: nowhere

Notes: You can fall here from a number of places. There is no escape – not even with the aircraft – so if you get into this situation you should quit and start again.

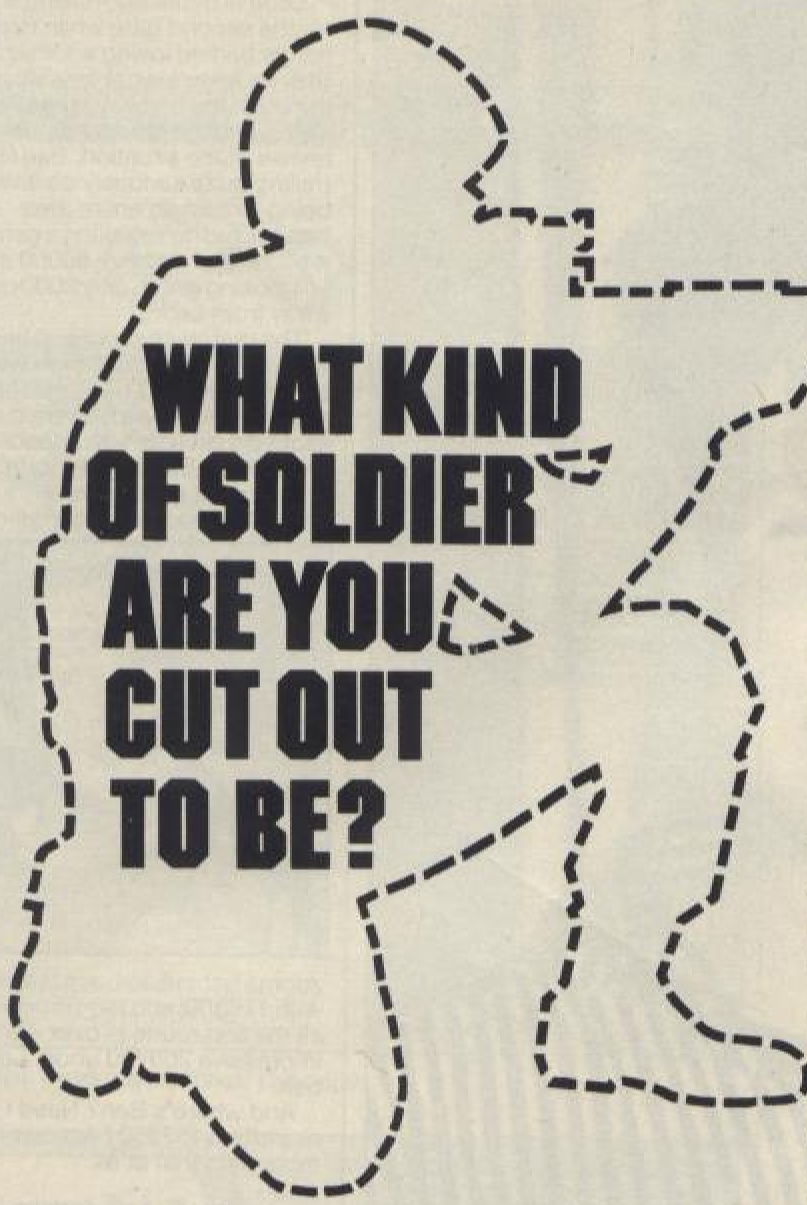
THIS MONTH'S COMP

Well, another Playing Tips finished and nothing much to say . . . except to tell you about yet another exciting cartographic competition. This time I'm looking for a map of all the levels of Gremlin Graphics's Northstar, Smashed on page 24.

The best Northstar map received at the Playing Tips desk by April 5 will receive £50 worth of software (increased for the golden issue – it's normally £30) PLUS a telescope, the better to chart those real space stations with!

And don't forget to send your POKEs, tips and maps for any game, new or old, to CRASH – there are also £50 software prizes (normally £30) for the best POKE/tip and map published each month. Post all your work and letter bombs to:

NICK ROBERTS
PLAYING TIPS
CRASH
PO BOX 10
LUDLOW
SHROPSHIRE
SY8 1DB



Special Telegraphists are fully trained in the use of sophisticated equipment in the related fields of military communications and communications security. Skills learnt include morse code, teleprinter touch typing and the operating of high grade receivers and direction finding equipment. Other careers in communications include Radio Telegraphist, Data Telegraphist, Radio Relay Operator and Technicians.

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To SPSO Royal Signals, Directorate of Army Recruiting, (Dept CR ICO), Room 1106A, Empress State Building, Lillie Road, London SW6 1TR.

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Address____________________

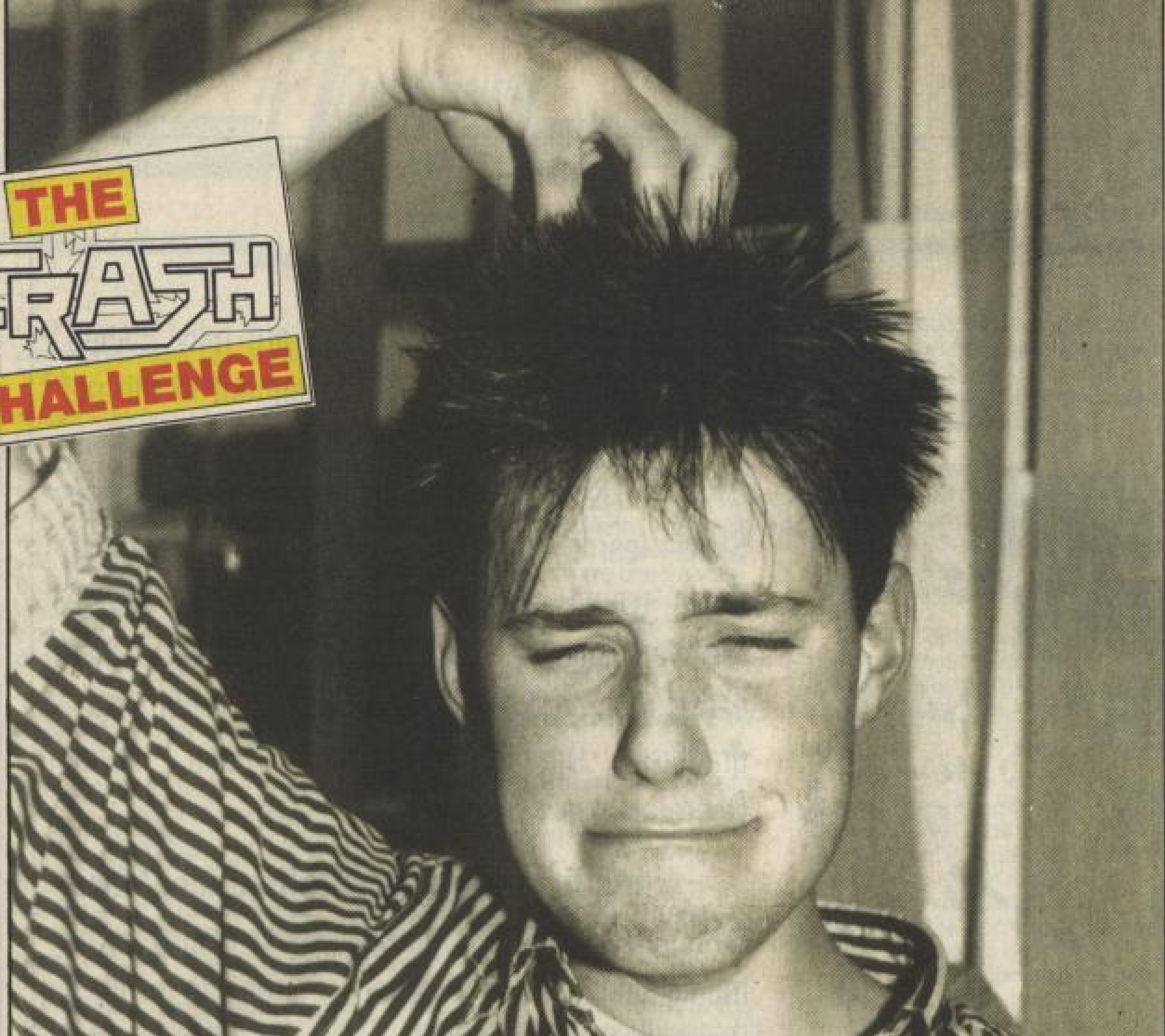
____

Date of Birth__________ Tel:__________

THE PROFESSIONALS

The Armed Forces are equal opportunity employers under the terms of the Race Relations Act 1976.

THE CRASH CHALLENGE



A GATE TOO FAR

Um, Ben Stone loses *Commando* to a reader but it's not like it sounds, OK?
MIKE DUNN reports, the other reviewers say 'Challenge? What Challenge?' and pretend the defeat is nothing to do with them.

ON February 1 1988, the sun didn't rise ominously over Ludlow's mist-shrouded hills. The wind didn't blow the dust and tumbleweed down the deserted streets past the saloon. And the two hardened gunfighters didn't face each other for the last time. In fact it was a pretty normal day here; it rained.

But there was a CRASH Challenge about to begin. Ben Stone, the longest-established CRASH reviewer, was our (almost) final hope – an unchallenged might on the keys of Elite's *Commando* (94% in Issue 24). Yet his unquestionable superiority had been doubted by a reader!

'Who is this mere mortal?' the entire dedicated CRASH readership (hello, mum) cries. No less than **Leon Hetherington** from Selly Oak in Birmingham . . .



ROUND ONE

We all take our places to watch the slaughter, and the Challenge begins. The polish of both players becomes evident as they chill their way to the end of the first level, all lives intact. The CRASH team waits tensely for Ben to make his move. Obviously biding his time, Ben breaks the first area 5 seconds and 1400 points behind at 18800. But then, horror of horrors, Ben's first life goes at a mere 26900 (my *high* score at *Commando*, but that's irrelevant); this is all part of Ben's careful strategy, we're assured.

Leon is definitely making a bid for the second gate while Ben hangs behind losing another life. Still, he knows what he's doing. 5 minutes, the halfway stage, is called and it's time for a brief review of the situation. Ben is trailing quite seriously on levels, being almost an entire area behind, but he's making a game of it scorewise – above 80000 and still looking good, only 2000 points away from Leon.

The match continues; it begins to look as if this challenge were well-founded as Leon hauls ahead at surprising speed. There's a slight pause when he encounters problems breaking the fourth area, but then everything goes smoothly; the 1-minute mark



zooms behind as Leon leaps out with 175300; and then in no time at all the first round is over with an impressive 209700 under Leon's belt.

And where's Ben? Need I say more than 157550? Actually it's no more than that at all.

BEN:	**157550**
LEON:	**209700**

ROUND TWO

A serious pep talk is needed. Through the dripping sweat and tears Ben sees the honour of CRASH at stake and resolves to do better this time. The starter's gun (stopwatch) goes off by mistake, but it's too late; they're off.

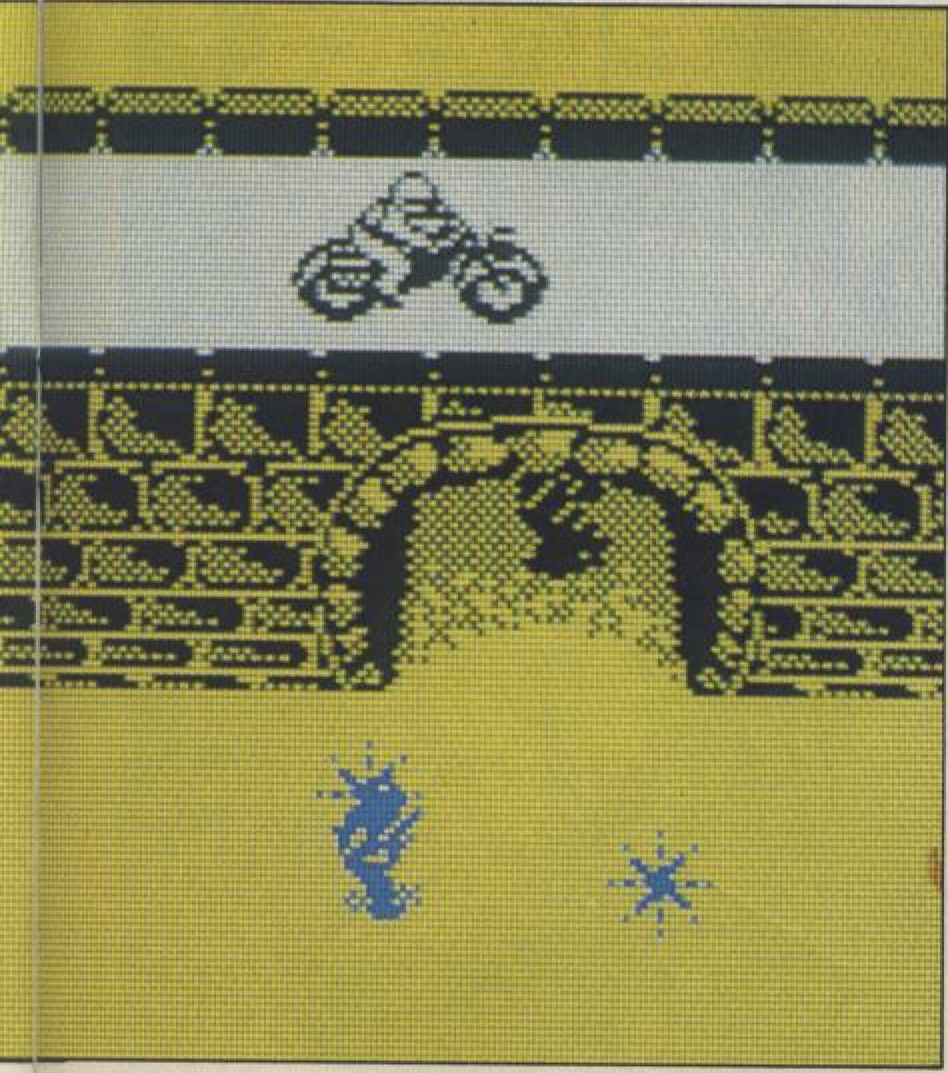
This round looks more interesting from the start. Ben and Leon are through the first area at the same time, and though Leon has a lead of a few hundred it's early days yet.

They're not halfway through the second stage when it happens: Ben takes the lead at 27860! But once the cheer has died down, it becomes apparent that his first life went at 30000 points, and that stifles the not-too-confident support.

Picking up just 3650 more points, Leon takes the front again.

The second gate stands no chance against the might of these mean dudes and it collapses in a flurry of points for Leon at 41450. As the dust settles we see that Ben's in gear again, ploughing ahead with a good 46250.

5 minutes gone and another 5 left – Leon's still trailing with 84500, and Ben breaks the 100000 first. Things are warming up, though, and the next 50000 points are spent in a fierce battle for the lead, with neither player holding it for more than half a minute.



▶ **Testing nerve and reactions:** *Commando*



The buckets we use to pour Ben's sweat into begin to overflow and a cry goes up for more containers. Then the final minute is called, and Leon is in the lead by several thousand. Ben's computer begins to hiss and steam under the waterfall from his brow. It looks like it's all over, and very soon it is. A heartbreaking defeat sees Ben over 200000 but 25000 behind.

BEN:	**205800**
LEON:	**230300**

It's all over and there's little time for excuses. Of course it was all to do with the time limits, I mean if Ben had had unlimited time, and another cup of coffee at 1419hrs and . . . and . . .

What's the point? Is there anything left to life after our fourth consecutive defeat? There are only two of our number left, and just looking at them (Robin and Bym) doesn't exactly inspire hope, does it? Still, Robin's promised to have a go at *Star Wars* for Issue 52 . . . see you there. Or here.

CRASH ZX SPECTRUM

CHALLENGE

CHALLENGE ROBIN CANDY!

We'll spare ourselves the embarrassment and leave out the mitigating circumstances, the better-next-time promises, the empty threats – it's just that finally Robin Candy has agreed to join the CRASH Challenge, and he'll play a reader in Domark's Star Wars **(84% Overall in Issue 48).**

The Challenge will take place sometime in March, so enter soon – and please leave the Force at home.

Just fill in this form and rush it to CRASH Challenge, CRASH, *PO Box 10, Ludlow, Shropshire SY8 1DB*.

Dear Robin Candy

I challenge you to play Star Wars **– quite soon in a small Shropshire market town probably far, far away from wherever I live. I've already scored ....**
So put that in your SCORES and smoke it . . .

NAME ....
ADDRESS ....
...
.... POSTCODE ....

TELEPHONE NUMBER ....
AGE ....

If you're selected for the Challenge we'll pay your fare to Ludlow and home again, keep you warm and well-fed while you're here, and blackmail you with all the photos that AREN'T published





COMPELLING *COMMANDO*

CONVERTED by Elite from a Capcom coin-op, Commando earned a high Smash (94%) in CRASH Issue 24 – and Christmas 1985 was an age of great games, with Elite's *Roller Coaster* among many other Smashes in the same issue.

Commando was hailed as 'horribly violent, and not much of an intellectual challenge – but great fun' and even as 'the best arcade conversion your Spectrum is likely to see', an unusually faithful copy of the original.

It sends the player on a mission to penetrate enemy lines and storm the gates of two mighty fortresses, each defended by four smaller bases.

You're armed with just a machine gun and a few grenades (more can be picked up), and to make things worse there are lorries filled with loads of well 'ard soldier types, heavily armed jeeps, trucks, motorbikes and far too many of those little blue men who run around and try to kill you.

So it's a man's life in *Commando*, but the very fast scrolling, dramatic sound effects and furious action make it, in CRASH's words, 'a great game for those into fast-moving violence – it requires fine-tuned reactions and a fair bit of daring'.


ULTIMATE
PLAY THE GAME
PRESENT
JETMAN
WAH! THE PLURPS ARE GROWING AN ASSASSIN TO GET RID OF ME AND FLASH GORDON....
OUR 'SSASSIN HIM GROWIN'!
HE PRECIOUS!
OH-OH!
I GOTTA PLAY IT COOL..
DARENT LET 'EM KNOW I KNOW...
WE'S BIN RUMMLED!
SAY... YOU PLURPS... LISSEN GUYS... CAP'N FLASH WANTS A NEW TUNIC AND A CUPPA.... OKAY?
WHUPS!
HIDE 'IM!
HE'S GON
TOOT
HO-HUM
PLIP
TUM-TE TUM-TUM-
LA-LA
WHISTLE
YO
HOKEY-DOKE
'S OO
SNIGGER
SPRING
CHOP HIT SLASH SCALD THUMP
ACID
ACK!
... WHILST FLASH GORDON HAS A SHAVE AND A HAIRCUT, AND TRIES ON HIS NEW TUNIC...
HO... LOONY! IF YOU'RE HAVIN' SO MUCH TROUBLE WITH THAT SALAD YOU'D BETTER TAKE THE CONTROLS FOR A WHILE INSTEAD!
HOW'M I LOOKIN' PLURF?
TWEE
WHUMF
ROAR
BUFF!
WHIZZ
WHAP WHOP
BISH
BASH
TOSH
KEEP HER ON COURSE FOR THE PLANET ZARG AN' GIVE ME A SHOUT WHEN WE ARRIVE...
SNAR
NYAH! I'LL ONLY TOLERATE THE FLASH LITTLE GET UNTIL HE LEADS ME TO THE TREASURE THAT HE HID ON PLANET ZARG!
MAYBE I SHOULD CONSULT THE 'EYE OF OKTUP' AN' SEE INTO THE FUTURE TO FIND OUT IF I GET THE TRES.....?
THE EYE...! IT WENT OUT THE WINDOW WITH THE PIRATES...
IT'S GONE...
I'LL NEVER SEE IT AGAIN...
IT'S GONE FOREVER...
I GOT TWO KINGS!
BUT HE GOT FOUR ACES...
YOU LOSE!
IT'S BEEN LOST IN SPACE!
LOOKS LIKE IT'S JUST BEEN WON IN SPACE... NEX' LUNE YOU GUYS....

CRASH COMPETITION



HELP!

DRAW A MONSTER FROM YOUR HAIRIEST NIGHTMARES AND WIN GAME ARTWORK FROM DESTINY

HALF MAN, half beast, wholly horrifying – that's the Yeti, or 'abominable snowman', believed to live in the Himalayan mountains north of India. And the Yeti's also the subject of **Destiny Software**'s first game, *Yeti*, programmed by Christian Urquhart (*Daley Thompson's Decathlon, Hunchback, Xecutor*) and Mike Smith (who also worked on *Xecutor*).

Yeti is set in the high Himalayas, and you must trudge through crisp snow, climb treacherous peaks and overcome the Dalai Lama's henchmen to find the legendary creature of the cold.

There are surprises of a different sort in *Teladon*, Destiny's second release, programmed by Nick Eatock (*Greyfell*). One load gives you two completely different game environments: in the first you jump on your hover-bike and speed down a hazardous valley, and the second returns to the well-tried 3-D-isometric setting.

And to celebrate the launch of Destiny Software, the company is giving away a print of the *Yeti* inlay artwork and a print of the *Teladon* inlay artwork as **first prize** in this comp!

Besides those two collector's items, the winner and **25 runners-up** will each receive a Destiny sweatshirt (for those cold walks up the Tibetan mountains) and a Destiny mug (for that well-deserved cup of cocoa).

Just draw the hairiest, snowiest, biggest-footed Yeti you can imagine on this pocket-sized Himalayan range, fill in the form and send it all off to **DESTINY'S BEST COMPETITION YETI, CRASH, *PO Box 10, Ludlow, Shropshire SY8 IDB*** to arrive by **April 5**.

The decision of CRASH's appointed judges is final in all respects – because that's one of them pictured above.



NAME ....

ADDRESS ....

....

.... **POSTCODE** ....

THE HEAT'S ON IN SKATE CITY



Screen shots from arcade version.

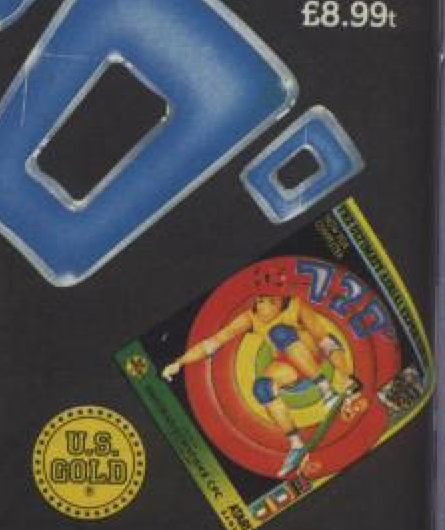


- "Those who like their action fast and furious should enjoy 720°" ZZAP 64!
- "A faithful and enjoyable conversion" ZZAP 64!
- "One of USG's best conversions to date" COMMODORE USER
- "For my money this is not just as playable as the coin-op it is infact much more playable" COMMODORE USER
- "Fans of the arcade original and novices alike should love this playable and addictive game – one of the most original to emerge this year" GAMES MACHINE
- "U.S. Gold has set a superb standard" CRASH
- "720° is the epitome of a classic. Its got every element of a great game" SINCLAIR USER
- "Did we flip over it? You bet!" SINCLAIR USER (Nominated a Sinclair User Classic)
- "Virtually flawless arcade game. Addictive smooth and slick, easily U.S. Gold's finest hour. Don't miss this one" SINCLAIR USER (Nominated a Sinclair User Classic)

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TECH NICHE SUPPLEMENT

Technical Writer — SIMON N GOODWIN

CARRY ON CL

Sinclair's computers – and successors

THE SPECTRUM is the best and most famous ZX computer – but it's worth remembering the other computers that Sir Clive Sinclair had a hand in designing before the ZX range was conceived.

By the late Seventies, Sinclair was running out of road. He'd hit trouble selling calculators and digital watches, and had been trying to make and sell a pocket-sized TV set since the Sixties. At last he'd produced one, but it was unreliable and difficult to make.

One plan to raise money for the TV project involved a computer, the NewBrain. Britain's Labour Government bought a large stake in Sinclair's firm, Sinclair Radionics, to try to keep things going – but lost confidence after a while. Radionics was split up and Sinclair left to run a new firm, Science Of Cambridge.

The NewBrain was sold to Newbury Labs, then to Grundy; at one time it was going to be the official BBC micro, but it reached the market too late and didn't catch on.

Over at Science Of Cambridge, Sinclair and an engineer called Chris Curry pooled their experience and invented a horrid wrist calculator, with keys you could press in three different directions for various functions – a sign of things to come!

> “By the late Seventies, Sinclair was running out of road”

CHEAP AND USELESS

Then they dreamed up a computer system which has never been beaten on price or uselessness – the MK-14. It used an obscure processor called an SC/MP, mainly because the firm that made it offered to design the computer for nothing as long as Sinclair used its chip.

The MK-14 had a calculator display and keyboard, 0.25K of memory, and no box. Sinclair sold 10,000, and decided that computers were a good way to raise money. Science Of Cambridge changed its name to Sinclair Research. And after moonlighting for a while, Chris Curry left, to set up Acorn computers.

In 1980 the first ZX computer was produced – the ZX-80, designed by Jim Westwood and with software by John Grant. The ZX-80 looked very much like a real computer, though it was made of bendy plastic, had no keys and was less than a quarter of the size it appeared in the glossy adverts.

You could program it in BASIC, using a TV display, and save programs on cassette. But lots of improvements were needed. The ZX-80 contained only 1K of memory, and it could only work with whole numbers between -32768 and 32767 – like the *ZIP* compiler in the CRASH Tech Tape. Worst of all, the screen went blank when you pressed a key or ran a program!

Still, the ZX-80 was a success, and even spawned a clone – the CompShop Micro Ace. A 16K RAM pack – prone to fall off at inconvenient moments – was produced, and various ingenious tricks were used to stop the machine overheating.

ZX-81 SUCCESS

Within a year the ZX-80 had been redesigned, with a custom chip in it to make copying more difficult, and with a much-improved display that allowed programs to run while the screen display was visible – albeit at about a quarter of the ZX-80's speed. And ZX BASIC was souped up to handle text and floating-point mathematics, though square roots didn't work properly at first.

The result was the ZX-81: a big improvement, launched in March 1981 at a price that undercut the ZX-80 by £30! The cloned Micro Ace disappeared, but Acorn Computers, founded by Sinclair's former colleague Chris Curry, got the BBC contract – the ZX-81 had only a black-and-white display.

The ZX-80 had been assembled for Sinclair by part-time home workers, but the ZX-81 was obviously going to sell too many for this arrangement to work. So Sinclair did a deal with Timex, which owned a big factory in Scotland. In return for building the ZX-81 Timex was allowed to sell it in the USA, paying Sinclair a 5% royalty.

The ZX-81 sold well – as did the US version, the TMS-1000, when it popped up in 1982. But Sinclair was still after the BBC contract, and in the summer of 1982 he announced the ZX Spectrum – a colour computer aimed at would-be programmers, with 16K or 48K memory. The extra 32K was fitted on an extra board inside the computer, so it couldn't fall off.

CHEAP AND POWERFUL SPECTRUM

The Spectrum hardware was designed by Richard Altwasser, now at Amstrad, and the software was adapted from the ZX-81's by Stephen Vickers. The Spectrum had a new custom chip which could keep a colour display up yet hardly slow the processor at all – but a last-minute bodge was needed to make the keyboard work properly. This was the 'dead cockroach' modification: a chip soldered on its back with its legs in the air!

At £125 for 16K, or £175 for 48K, the Spectrum was very cheap and very powerful for its day. The 48K model seemed such a good deal that it sold eight times as well as the 16K model from the start, so a new version was produced – the issue 2 – which could hold 48K on one board. The issue 2 had blue keys, rather than grey ones, to make the lettering all over the keys easier to read under electric light.

Meanwhile Altwasser and Vickers left Sinclair to set up their own firm, Jupiter Cantab, selling a small fast computer that was a cross between a Spectrum and a ZX-80. Their Jupiter Ace flopped.

REFINEMENTS

Sinclair refined the Spectrum again in 1983, making BEEP slightly louder, using a cooler logic array, and adding a minor tweak which unfortunately stopped lots of sloppily-written games recognising the

RY

IVE

keyboard. This Spectrum was the infamous issue 3.

Back in the USA Timex was bemused by the success of the TMS-1000, and tried to follow it with a 16K variation, the TMS-1500. It flopped, so Timex came out with the TMS-2068 – a superSpectrum with graphics much like the new SAM (see page 58) and sound like a Spectrum 128K. That flopped too, mainly because of competition in the US market and poor software compatibility. Timex gave up in February 1984.

Meanwhile, the rubbery Spectrum keyboard was universally hated, so Sinclair tried to develop something better-looking. The result was the Spectrum +.

Brilliantly, with the + Sinclair preserved total compatibility by using exactly the same circuits as in an old Spectrum, in a new box. And the + sold well, for a while, though the routines to read the keys still insisted you pressed them one at a time – fine for rubber keys, but now very frustrating.

THINGS GO WRONG

Sinclair had been putting off plans for a superSpectrum since 1982. He spent most of 1983 designing a portable business computer, but at the last moment a near-random collection of design features merged into the Sinclair QL. The QL was launched, designed, manufactured and made to work, in that order.

In 1985 Sinclair's main distributor, Prism, collapsed. The QL price was slashed in half. Sinclair, now a knight, was busy advertising electric tricycles. Robert Maxwell stepped in, sniffed the air, and stepped out again.

And by now the Spectrum was not considered sophisticated, even with the new keyboard. People began to demand more memory, interfaces and better sound. A mixture of new and TMS-2068 features were cobbled together to make the Spectrum 128K. The money for the 128 came from Spain, so that's where it was launched.

In January 1986 the Spectrum 128K was launched in the UK, in desperate bid by Sinclair to look busy as debts piled up. But by March the bank had closed Sinclair's accounts and the company staff were paid on the firm's behalf by a large retailer that took stock in return.

OVER TO AMSTRAD

On April 7 1986 Amstrad bought the right to make Spectrums, and to kill the QL, for just £5 million, and also paid £11 million for the remaining stocks.

Unconfirmed reports suggest that about 4 million standard Spectrums were produced by Sinclair Research. And there must be about 500,000 128s in circulation now, with the bulk of those being first-edition Amstrad +2s.

A few Sinclair staff moved to Amstrad and produced the +2: a 128 in a new box with a cassette drive 'glued on', as Amstrad boss Alan Sugar put it.

A year later came the first true Amstrad Spectrum – the +3, minus Sinclair chips and plus the disk system from Amstrad's scrapped CPC range. The +3 is a new design, not very compatible with the old Spectrum and its wealth of 48K hardware and software.

And reports from abroad suggest that new +2s will contain stripped-down +3 boards, rather than the relatively costly but compatible +2 design. (To tell the old version from the new one, press BREAK and reset at once to get the TV tuning display. Then press the six keys QAZ and PLM at once. A new, less compatible +2 will go into a self-test mode, as on the +3, whereas an older +2 will ignore the keys.)

Clive Sinclair is now selling a portable computer called the Z88, designed by Jim Westwood and using the same Z80 processor as the ZX range. He's still trying to raise money to do other things.

Richard Altwasser, who designed the first Spectrum hardware, heads Amstrad's tiny hardware-design group, which has little time for the Spectrum.

The future now seems to lie with machines like Miles Gordon Technology's SAM. But whatever happens, the ZX Spectrums will be around for a long time yet ☐

ALL IN THE FAMILY

1980

☐ **ZX-80**
£100; 4K ROM, 1K RAM; whole numbers only; very limited black-and-white graphics but basic 32 x 24 screen established. Total sales about 50,000.

☐ **MICRO-ACE** (clone)
£80; 2K RAM; ZX-80 kit copy

1981

☐ **ZX-81**
£70, $150; 8K ROM, 1K RAM; floating-point maths; slow but continuous black-and-white display. 500,000 sold in the first year.

1982

☐ **TIMEX TMS-1000**
$100; licensed ZX-81 – a big hit for Timex in the USA

☐ **ZX SPECTRUM**
£125 (16K), £175 (48K); 16K ROM, 16K/48K RAM; colour graphics and much-improved display circuitry. 60,000 issue 1 Spectrums sold; grey keys, add-on 32K, 'dead cockroach' bodge.

☐ ZX-81 price cut to £50

☐ TMS-1000 price cut to $40

☐ 500,000 issue 2 Spectrums sold; blue keys, 48K RAM onboard; bodge transistor soldered over ULA

1983

☐ **JUPITER ACE**
£80; spin-off; 8K ROM, 3K RAM; Forth Spectrum keys/tape/display

☐ 3,000,000 + Spectrum issue 3s sold: new low-power ULA, louder BEEP, runs cooler, no colour tweaks, key port incompatibility. Prices cut to £100/£130 (16K/48K).

☐ **TIMEX TMS-1500**
$80; 8K ROM, 16K RAM; ZX-81 with better keyboard – a flop

☐ **TIMEX TMS-2068**
$150/200; 24K ROM, 16K/48K RAM; paged in 8K lumps up to 256K. Improved BASIC, sound and much better display, but very in ompatible. UK PAL TV version never marketed.

1984

☐ **SPECTRUM +**
£180; issue 3 circuits (with minor revisions) and extra RESET button; new box and keys

1985

☐ Spectrum + price cut to £130, 16K and rubber-key versions discontinued

☐ **SPECTRUM 128K**
£180; 32K ROM and 128K RAM, in 16K pages; RGB; old box and chunky heat sink: no keywords; three-channel sound; clumsy screen editor; MIDI/serial port; funded by Investronica

1986

☐ **SPECTRUM +2**
£140; the old 128 in a new box, with a better keyboard and cassette unit 'glued on'; 250,000 sold in first year; the first Amstrad Spectrum

1987

☐ **SPECTRUM +3**
£249; 3-inch disk; AMSDOS in 64K ROM; first radical redesign since 1982. Earlier 128s were more compatible with existing hardware and software than the +3 – they had extra features just bolted on rather than built in.

☐ Spectrum +3 price cut to £199 – some stores discount further to £180

1988

☐ **SPECTRUM +2** (revised)
64K ROM, 128K RAM; outwardly as older +2s but less compatible inside

☐ **MGT SAM** (not yet on sale; see page 58)
£99.95; 32K ROM, 64K-256K RAM; 48K-compatible but faster and higher spec – eg 32/64/80-column text

PLUG POTE

The charm of magic buttons

ONE of the most popular and versatile Spectrum add-ons is the 'magic button' interface, which lets you interrupt the operation of any program, run a routine, and return to the original program later.

All the devices reviewed here work much the same way. They turn off an area of fixed program in the Spectrum's memory – the ROM that recognises what you type when you turn the machine on – and replace it with memory into which you can load anything you like. Sometimes they also contain their own fixed program.

Lots of firms have made this sort of device. Once-popular devices such as the **Mirage Microdriver** and **Interface 3** are no longer on sale, and the remaining companies spend lots of time developing their products and adding extra bells and whistles.

Most magic-button interfaces provide several extra hardware tricks besides the basic interruption facility. Prices and options vary widely. This article reviews four major models: the **Multiface** and **Multiprint**, made by Romantic Robot; Datel's **Snapshot 2**; the **Swift Disc**, made by Sixword; and the **Plus D** and **Disciple** interfaces from Miles Gordon Technology (MGT – producer of the Spectrum superclone SAM, featured on page 58). (The Disciple is marketed by Rockfort Products.)

USING THE MAGIC BUTTON

There are three main uses for magic button devices: program-copying, screen-printing and hacking, which is best defined as 'changing the operation of existing programs to make them more interesting'.

First and foremost, magic buttons make it easy to copy games to microdrive, cassette or disk. These devices can save the entire contents of memory – including register values – in a big file, like a photo or snapshot of the state of the machine.

As long as the device saves everything there's no way the program can tell it's been interrupted, and the snapshot copy will restart wherever it left off as soon as you reload it.

This is good news if you want to speed up loading of a program, as it makes it easy to save the program on any device. Most commercial disk systems would be useless without such a facility, because programs are usually protected to make it difficult for people to read the tape and write out an identical copy.

Software houses don't like disk systems, though arguably disks encourage people to play games – they see it as too easy for a gang of people to buy one tape and then use a snapshot device to take lots of copies of it, stripped of the antipirate protection. Unfortunately this attitude lumps honest users of disk systems in with the thieves.

If you're playing games, or developing something on the screen – text or graphics – you can use the magic button to grab a screen, either saving it on disk or tape to be reloaded later or printing it out.

With this useful facility you can keep print-outs of screens as progress reports, and they're a wonderful way to make a map of a multiscreen arcade game, a simulation or a text adventure.

Black text on white paper is always the easiest and quickest type of print-out, but some routines can print graphics in shades of grey. (You have to have the right printer – see Choosing A Printer in this supplement.)

The third – and to my mind most interesting – application of the magic button is hacking. You can load all sorts of programs into an interface and call them up any time by pressing the button.

> “Magic-button print-outs are a wonderful way to map an arcade game”

SPECTRUM TASKING

The CRASH Tech Tape contains a program that illustrates this idea very nicely. ***Three In One***, by Khalid Rafiq, is a short, fast-loading program that works with the Multiface One, Multiface 128 and Multiprint. It lets you have three programs on the go on one computer at the same time!

The only restriction is that the programs should fit into 16K of memory, so that there's room for three in 48K. This is a limitation, but not a serious problem – many good early Spectrum games and utilities were designed to run on 16K systems, because the original entry-level Spectrum had only 16K of memory.

You can run any three programs, BASIC or machine-code, at once. I've had no trouble running such classics as Don Priestley's *3D Tanx* as well as *Gold Mine* and *Munchman*, two early 16K games written by people with the unlikely names of Simon N Goodwin and Derek Brewster. Good 16K games include *Deathchase* and *JetPac*.

Three In One doesn't give true multitasking, as any one time only the program shown on the screen is running, but it's fun. Now you can play a game, switch to BASIC whenever you want to work something out, and then go back to the game instantly.

The screen is always kept up to date, but the border colour can take a while to catch up with you. And it takes less than a second to swap programs, but it's important not to press the button again before the next program restarts, or *Three In One* may get knotted.

The utility runs in 48K mode on a Spectrum 128K, so it doesn't use the extra memory. It should be possible to adapt it to run more or larger programs in 128 mode.

POKE POWER

Some magic-button devices contain simple editors with which you can change crucial instructions in the main program

G-IN NTIAL



☐ ***Romantic Robot's Multiface 3: priceless +3 plug-in***

– to give yourself extra turns in a game, or to change the score or the playing conditions.

These changes, or POKEs, are discovered by keen programmers who analyse commercial software and work out interesting ways to alter them. The Playing Tips section of CRASH is always full of Multiface POKEs which can be used with most magic-button devices.

Some programs try to work out POKEs for you automatically. These don't always come up with anything useful, and they can easily crash a program by adjusting something that should be left alone, but they're great fun to play with.

The first such program was ***The Gamester***, featured in CRASH Issue 41. This program runs on the Multiface One, Multiface 128 and Snapshot 2 devices. It will search for POKEs to give you infinite lives in games, and works quite well with some programs. It also lets you run most games at half or quarter speed, which may be useful if you want to cheat or take photographs.

> "The Multiface 3 is so useful to the +3-owner it's almost essential"

The Gamester sells for £5, and is available direct from author D R Walton at *155 Wash Lane, South Yardley, Birmingham B25 8PX*. When ordering it, be sure to say which interface you own. CRASH readers who bought the first version are allowed a free upgrade if they return their original tape.

Romantic Robot has recently released its own version of this idea – the £7 ***Lifeguard*** program will work out POKEs for you automatically.

Both *The Gamester* and *Lifeguard* are rather unpredictable, because they both work by looking blindly through the contents of memory, adjusting parts of the program that appear to keep count of something, in the hope that the change will make the program easier to use.

Lifeguard is a bit less hit-and-miss than *The Gamester*, but has much the same effects and limitations. It works with three of Romantic Robot's own interfaces: the Multiface One, Multiface 128 and Multiprint.

MEMORY ANALYSIS BY DISASSEMBLY

The POKEs in magazines are usually sent in by programmers who use a mixture of automatic and manual techniques to analyse a program before they start fiddling with it. This is hard work but has great potential, as in theory a good hacker can make just about any change that the original programmer could have made. Quite significant changes to gameplay are possible . . .

The problem is that you have very little information when you're putting in POKEs. ▶

Everything in the program – code, graphics, sounds, scores and so on – is muddled together in a stream of 49,152 numbers.

But Romantic Robot sells a £9.95 package called ***Genie*** that lets you analyse the contents of memory in detail.

Genie can search for text or other patterns in memory, has good facilities to edit a program, and can automatically translate numbers in memory into assembly-language program instructions.

This process, called disassembly, makes it easy to follow other people's programs, but you must be able to read assembly language or you won't be able to tell real programs from the misleading information that you get if you try to disassemble graphics or other data! *Genie* works with the same gadgets as *Lifeguard*, but you can't use the two programs simultaneously.

Genie won't work with magic-button disk systems, but Sixword is working on its own monitor/disassembler package to run with the Swift Disc.

The company has already produced a microdrive-emulator package that makes its disk drive behave like up to four very fast microdrives. When the £12 emulator is loaded you can run special versions of serious programs that allow microdrive filing but wouldn't be able to handle the disk unless they were heavily changed.

DISK MAGIC

Normally the magic button on the **Swift Disc** calls up a new command level. The bottom two thirds of the screen are cleared temporarily, and you can type in a wide range of commands affecting the disk drive and the program in memory.

You can enter POKEs, read the disk directory, save, load, erase and protect files. You can format new disks, load and save sections of memory including the screen, and copy programs from one drive to another. When you've finished housekeeping the old display reappears and everything continues as before.

The magic button on the **Disciple** disk system and the **Plus D**, both from MGT, is more limited. They let you print the screen display in black-and-white or shades of grey, as long as you've got a printer that works something like an Epson. Alternatively you can save the display on disk, or save the entire contents of memory as a 48K or 128K file.

disk systems .... page 56

MULTIFACE MAGIC

The Multifaces are add-ons, rather than controllers of disks and printers. The £34.95 **Multiface One**, designed to run on 48K Spectrums, can save and load 48K programs and screens on tape, microdrive, wafadrive and most disk systems. Files are written in a compressed form, to save space and speed up loading.

It also lets you print the screen display if you've already got an appropriate printer wired up. You can enter POKEs, and load utilities like *The Gamester*, *Lifeguard* and *Genie* into its 8K RAM. It has one Kempston-standard joystick interface built in.

The **Multiface 128** is similar but can save 128K programs as well as 48K ones; it costs an extra £5. Both Multifaces annoy



software houses by allowing you to reload files you saved even if the Multiface is not present – in other words, they produce files that can be freely copied.

By far the cheapest snapshot device is the eponymous (LMLWD) **Snapshot 2** from Datel, which costs just £25. But this is less of a bargain than it seems – the one CRASH tested last year was hard to use and unreliable.

Unlike the Multifaces, the Snapshot 2 does not contain a built-in program, so you must load a file from tape or disk before starting to use it. It is meant to transfer compressed files to cassette files or microdrive.

Readers' impressions have been mixed – some people find it works OK, but others have had to return it as unusable. The software I received had bugs, the built-in joystick interface wouldn't work with all sticks, and despite hours of trying I was only able to persuade the Snapshot 2 to transfer one old program to microdrive.

I suspect that there is something wrong with the design that stops it working on all Spectrums; sloppy design and assembly do not encourage me to recommend the Snapshot 2.

GET IT ON PAPER

Take care choosing a printer

*There are two different sorts of Spectrum printer – 'dedicated' ones specifically for the Spectrum, such as the **ZX Printer** and **Alphacom 32**, and standard ones, intended for any computer. The dedicated ones are cheap, but use narrow rolls of peculiar paper and only work with 48K BASIC. They plug directly into the back of a Spectrum.*

Standard printers cost more, and plug into either a serial interface or a parallel interface. Standard printers are a better bet if you've got a Spectrum 128K, as that has a serial interface built in. The +3 has both sorts of interface; the parallel one is usually easier to get working.

*If you need a parallel interface on an earlier Spectrum you must buy it as an add-on. Consider products like **ZX Lprint**, the **Multiprint** and the **Disciple** and **Plus D** interfaces. The cheapest and bulkiest option is a **Rotronics Wafadrive** – a slow and unpopular fast tape system with a printer interface built in. Beware: this device is not compatible with many programs, though it should work OK with ones you write yourself.*

*Hardware and software support for printers is centred on **Epson** printers, which have dominated the market for the last few years. The genuine Epson printers are made by Seiko, but several other firms make copies or equivalents that claim to be compatible.*

These claims are not always true; the degree of compatibility varies between models and even between different runs, so in practice 'compatibility' depends upon exactly what you want to do. It can take a lot of technical knowledge to work out whether or not a printer is compatible.

Generally speaking, cheap printers are not Epson-compatible and good ones are. If in doubt, try before you buy. It's impossible to advise people on what printer is best to buy – it depends entirely on what you intend to do, what programs you've got, and what you may do in future.

There are millions of permutations and there's no magic formula you can follow when buying a printer.

*You must think carefully, and ask questions. If you can't do that, the safest bet for Spectrum-users at the moment is probably a genuine **Epson LX-800** – but that will set you back a couple of hundred pounds.*

Whatever printer you choose, make sure it has the appropriate interface – either serial or parallel, depending on your computer and add-ons – and try it before you pay, or get a guarantee that you can return it if it doesn't work. It's best to avoid chain stores; buy from specialist dealers who can help you if you get stuck.

Beware! Many printer dealers are fly-by-night cut-price box-shifters, with an Ansafone and a front room filled with unwanted production from some far-away assembly line. Get every guarantee you can think of.

Check that the printer will work with cheap standard paper and printing ribbons. Some printers need expensive paper or nonstandard sizes, some use expensive ribbons only available from a few suppliers.

Many printers are sold like Polaroid cameras – the machine is cheap but the supplies are rare or expensive.

NEVER EVER buy a second-hand printer without a manual! You'd be amazed how many letters CRASH gets from people who've bought obsolete or incompatible printers and inevitably can't get them to work with their Spectrums. If you do have problems, contact the people who produced the software, the printer, and the interface (if any), but don't expect help other than a yes/no indication of whether it will work, and don't buy from anyone who isn't sure. Check before you buy, not later.

*We get so many letters inquiring about cheap **Brother** printers that I'll pass the buck and give the phone number of that firm's little-advertised but helpful support service. For information on Brother printers call (061) 330-6531; ask for extension 303 if you need spares, or extension 315 for technical advice.*

Please don't write to CRASH asking why you bought the wrong printer, or what you should do about it – just take care with the complicated choice, because mistakes can be costly □



+3 PLUS

When Amstrad launched the +3 last year it changed the Spectrum design so that none of the existing magic-button devices would work. And the new design made it almost impossible to transfer programs to the disk drive built into the computer; since very few programs are available on disk, that left a lot of frustrated users.

Romantic Robot has resolved this frustration, at a price, by launching the **Multiface 3**, a new magic-button device specifically for the +3. The new unit lets you save and load programs or screens, format disks and erase files, from 128K or 48K BASIC. You can also examine memory and enter POKEs.

The Multiface 3 is quite different from its predecessors – there's no joystick socket, and no room to load current versions of *Genie*, *The Gamester* or *Lifeguard*. In theory +3 programs can be written in such a way that the Multiface can't copy them, but in practice it seems to be able to cope with just about everything on the market at the moment.

The Multiface 3 costs £39.95, or £44.95 with a through port. It's so useful to the +3-owner that it's almost an essential purchase, but it's important to bear that extra £44.95 in mind if you're considering buying a +3. You may be better off with an older, more compatible Spectrum and a superior disk system from MGT, Rockfort or Sixword.

> “Many printer dealers are fly-by-night cut-price box-shifters”

MAGIC PRINTING

Romantic Robot's **Multiprint** combines the magic button with a parallel printer interface. You can print out screens or send controls codes to the printer at any time, but it won't save software for you. The print-out routines assume you have an Epson-compatible printer, though the Multiprint will work with most other parallel printers except for printing graphics. And it works with any Spectrum except the +3.

The Multiprint has 8K of RAM and 8K of ROM, like other Multifaces, so you can use it to run *Genie*, *Three In One* and *Lifeguard*. It also includes the Multiface Toolkit, which lets you examine memory and enter POKEs.

The Multiprint cost £39.95 when it was reviewed last year in CRASH Issue 40, but Romantic Robot couldn't justify that price after MGT's Plus D appeared, so it's now £29.95. That's good value if you need a printer interface and you're sure you won't want a disk drive for your Spectrum. The price goes up by £5 if you need a through port to plug other peripherals, such as joystick interfaces, into the back of the Multiprint and use them at the same time as your printer

THE GUIDE TO ADD-ON PORTS

Handy addresses for hackers

These tables show the port numbers, or hardware addresses, you can use to control common interfaces. It's helpful if you write programs in such a way that these numbers can be changed easily – so using these tables smart hackers can write adaptable programs that will work on *any* magic-button device without conversion work.

SNAPSHOT DEVICES

device	page IN	page OUT	ROM	RAM
Snapshot 2	OUT 127,67	OUT 127,66	none	0-8K
Multiface One	IN 159	IN 31	0-8K	8-16K
Multiface 128	IN 159	IN 31	0-8K	8-16K
Disciple M/F 128	IN 191	IN 63	0-8K	8-16K
Multiprint	IN 187	IN 191	0-8K	8-16K
Multiface 3	IN 63	IN 191	0-8K	8-16K
Disciple disk	IN 187	OUT 187	8-16K	0-8K
Plus D disk	RST 8 DB 71	OUT 231	0-8K	8-16K
Swift Disc	RST 8 DB ?	RST 8 DB ?	0-4K	4-12K

Use the 'page IN' instruction shown to move the add-on ROM and RAM into memory addresses 0-16383 (typically). Use the 'page OUT' instruction shown to restore the Spectrum ROM.

ZX BASIC will crash unless the Spectrum ROM is in place whenever BASIC commands are being executed. The IN and OUT instructions won't work from BASIC – you must use machine code.

A special version of the **Multiface 128** is available to work with the Disciple disk. The Multiface ports are different in this case – that's to avoid clashes with the Disciple hardware, which has another, more limited magic button of its own.

The **Plus D** is unusual in that you call up its RAM and ROM by executing a RST 8 instruction followed by a byte value 71, rather than by reading or writing to a port. The **Swift Disc** works similarly.

SOUND DEVICES

device	OUT port	IN port	strobe port
Datel Sampler	OUT 127,X	IN 127	IN 191
SpecDrum	OUT 31,X	none	none
Cheetah Sampler	OUT 191,X	IN 191	IN 127
Music Machine	OUT 159,X	IN 191	IN 223

OUTPUT: X represents the sample value to be transmitted. To send it, just OUT it to the port number shown in the table.

INPUT: First access the strobe port to tell the computer to start measuring the input level. Wait for 10 to 20 microseconds, then read the sample level at the IN port.

Cheetah's **SpecDrum** uses a partially decoded port number, so it will also respond to values sent to port 159, as used by the RAM Music Machine. Music Machine software will work – for output only – with SpecDrum hardware, but the sound quality isn't as good as when you use Cheetah's software

SAM

Beyond the Spectrum – a superclone takes shape

THERE'S a new, very fast, low-cost computer under development – a computer which will run Spectrum software. It's the Spectrum 'superclone' introduced in the CRASH Christmas Special. I've now seen the prototype in action and tested it – and it works!

The codename of the new machine, which will cost £99.95, is SAM. It runs at almost twice the speed of a normal Spectrum, and can work with 64K to 256K of memory.

SAM will run almost all existing 48K Spectrum software, and should eventually be able to run true 128 software as well, but it's not *just* a 'Spectrum clone' – despite a proposed price under £100, SAM is a much better computer than an Amstrad Spectrum, and has lots of unique extra features.

Cambridge-based Miles Gordon Technology (MGT), which developed SAM, plans to give the ZX market the biggest boost it's had since the Spectrum launch six years ago.

THE PROTOTYPE

The latest SAM prototype is hand-built on two circuit boards, with a plug-in kit keyboard. When launched it will be a small computer console with 48 keys and a magic button on the top.

All the components on the second circuit board will be squashed into one 1,000-gate logic array. At the moment the circuit is made up from 75 complicated building block chips, put together to prove that the design works – which it certainly does!

GRAPHICS

SAM improves on the Spectrum display in several respects. For instance, you can display 85 columns of text on a monitor, or a clear 64 columns on most TVs. The display uses a new mode that gives 512 dots across the screen, and the normal 192 lines; unfortunately it's not the best mode for games, because you are restricted to just two colours over the whole screen.

But you can get much-improved 16-colour graphics by using another new mode. The display uses the usual 256 points and 192 lines, but the normal Spectrum attribute restriction is relaxed, so you can have any two colours in any row of eight points.

Sinclair and Amstrad Spectrums only allow two colours in any character square (block of 64 points). The new SAM mode means that graphics can use eight times the normal colour resolution, avoiding many attribute problems and allowing prettier displays.

MEMORY MANAGEMENT

The display can be read from any of the 16 16K pages of memory. This makes SAM much more flexible than the Spectrum 128K, which only lets you put the display in two of its eight pages.

Normally the display dots are read from a 6K area at the start of a page, and the colour information comes from 768 attribute bytes thereafter. But in the new modes SAM has a whole extra 6K of video information, read in parallel with the original 6K but held halfway through the same 16K page.

In colour mode the extra information sets the colours for the corresponding line of eight pixels. In 85-column mode it provides eight two-colour pixels to appear after the eight that have just been read from the normal video area. In other words, groups of eight pixels are read alternately from two display areas, 8K apart.

This sounds hairy for programmers, but in fact it's not too bad – just add 8K to move from point information to colour information, or toggle bit 13 of the address when moving from one group of eight pixels to the next in 512-pixel mode.

SPEED

SAM uses a souped-up version of the Spectrum's Z80A processor. The Z80B in the SAM prototype runs at 6MHz – getting on for twice the speed of a normal Spectrum – and can handle 64-256K of internal RAM.

The first 64K is arranged continuously from the bottom to the top of the Spectrum's memory map. Two 16K ROMs can be enabled independently at the top and bottom of the map.

All 16 RAM pages – including the other 12 in a 256K system – can be freely switched into either of the 16K slots in the top half of the memory map.

You do that by writing two page numbers, each between 0 and 15, to port 229. One says which page you want in the top 16K, and the other selects the page for addresses 32768-49151. You can read the values in these ports whenever you want to know how the memory is mapped out.

Arcade games usually keep a constant speed, regardless of how much is happening on the screen, by synchronising themselves to the steady output of 'frames' of display information. SAM could run much more complicated games than a Spectrum, because of its increased processing power, but most current titles will run on it at their normal speed, perhaps with slightly less graphic flicker.

A complete display frame is sent to the TV or monitor 50 times a second. An interrupt signal tells the program when the next frame starts. Good games may redraw the screen every one, two or three interrupts; the more work to be done, the slower the redrawing.

SAM works faster than a Spectrum, but the extra time saved is usually spent waiting for the next frame, so games don't necessarily run faster. (Of course, this means they're still playable.)

Processor-intensive things like utilities and languages run 50-100% faster on SAM than on the Spectrum, depending on the areas of memory used. All SAM memory runs at the same high speed, but some Spectrum RAM areas are slower than others.

COMPATIBILITY

I took Hewson's *Uridium* down to Miles Gordon Technology's lab and loaded it into SAM. The commercial cassette uses a high-speed loader, but that worked fine even though its code ran more quickly than normal in SAM's memory. Presumably the loader, like most modern tape routines, automatically works out the ratio of the tape and memory speeds by analysing the leader tone.

SAM is designed to load tapes in the Spectrum format at normal or high speed. Tape files are usually written out at 2250 baud – 50% faster than a Spectrum – but you can load normal commercial 1500-baud tapes too. SAM will sense the speed automatically.

CINEMASCOPE ON SAM?

Once loaded *Uridium* ran at the usual speed, with a slightly wider screen than usual. (The differences inside SAM make the vertical borders narrower than on a Spectrum, though the display still fits comfortably on a TV.)

Uridium redraws everything after each three frames, or 17 times a second. That's about the slowest rate that will fool the brain into thinking it sees smooth movement.

The SAM display was flicker-free, and colours were solid and unwavering on both the TV and monitor screen, with no sign of the colour fringes that sometimes appear at the edge of Spectrum graphics. (These fringes are caused by timing mistakes in the Spectrum ULA, particularly on early machines; SAM has no such trouble because it does not contain any Sinclair parts. To be fair to the Spectrum's original designers, though, MGT has

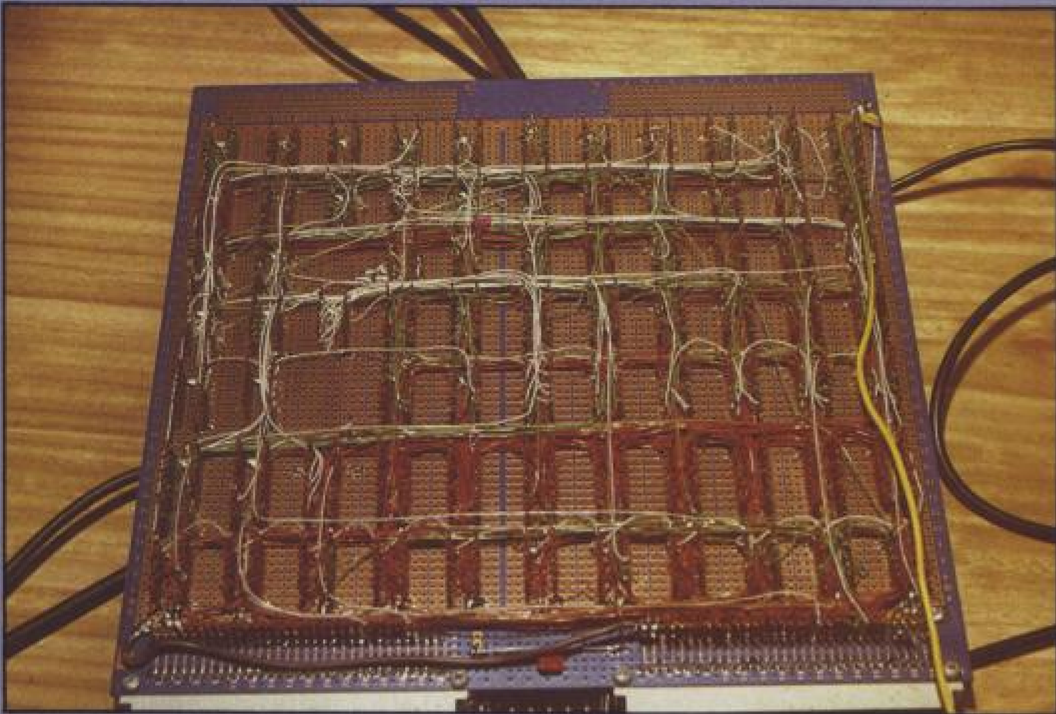
much more powerful chips to play with.)

Compatibility was not quite perfect – the 48K version of *Elite* loaded, but crashed after the Lenslok test. (This may be a particularly fussy program, as it does the same in 48K mode on a 128.) SAM seemed to cope fine with other 48K Spectrum games, such as *JetPac* and *Gauntlet*, and is definitely more often compatible with them than is Amstrad's +3.

SAM can handle up to 256K of internal memory, and in theory has facilities to use another 512K outside the computer. But the memory-management system is not the same as Sinclair's, so games specifically written for the 128 will require small but fiddly alterations.

It will be a while before SAM is compatible with 128 games, but true 128K titles are still rare. Software houses already writing for the 128 should find it easy to make new programs compatible.

Eventually SAM should be able to run many of the half-finished programs that were developed for the Spectrum but never released because the Sinclair machine couldn't run them at a sensible speed. I'm sure a few software houses have such titles up their sleeves, just waiting for extra processor power!



□ ***Building Spectrum history: the SAM team. (Left to right: designer Bruce Gordon, marketing men Jess Sullivan and Alan Miles.)***

PERIPHERALS

The SAM prototype doesn't have an edge connector, so I wasn't able to test it by plugging in Spectrum hardware add-ons. But the designer, Bruce Gordon, has already designed add-ons such as the Plus D and Disciple disk systems, so he has a good idea of how the edge connector works.

□ ***The underside of the logic array: the prototype's hundreds of hand-soldered wires will all vanish into a custom chip in the finished SAM***



Gordon doesn't guarantee compatibility, but says that the same signals are available, with the exception of the +12V and -5V supplies. SAM only uses port addresses reserved by Sinclair, so most third-party gadgets should work. (Tech Niche will report back on this aspect as soon as MGT has added an edge connector.)

SAM has quite an array of built-in ports. There are two network ports, as on the Disciple, which allow several computers to share a disk and printer. But serial and parallel printer ports are extras – they're not built into SAM as they are into the +3.

Unlike the 128's, SAM's MIDI port lets you read musical information as well as write it. It's also compatible with DADI, the new standard for Domestic Appliance Digital Interfaces – maybe you really will be able to control a power station with your micro soon!

The cassette port uses a single socket for both input and output, but you can put two plugs on the tape-recorder end if you don't want to have to plug and unplug things as you load and save. This arrangement works with any tape recorder that suits the Spectrum – tape loading seemed reliable

□ ***SAM can display much more intricate colour than a Spectrum: a loop POKEing random colours into the new machine's memory gave this kaleidoscope effect*** ▶



PLAY IT SOON, SAM

SAM will not be on sale for months yet; its development is at about the point at which Sinclair started advertising products. But Sinclair and Amstrad were never so open about the state of a machine's development.

Now that the main design is complete there are three more hurdles to be jumped before the computer can go into production. Firstly, MGT must convert the prototype circuit into a logic array; this is already under way.

Secondly, MGT must find a case for the machine – either a development of one of the add-on keyboards marketed before the Amstrad Spectrums arrived, or a totally new (and therefore relatively expensive) case.

And MGT must complete a ROM, holding built-in programs, before SAM can run independently. Normal Spectrum BASIC programs will run already, using a copy of the Spectrum ROM loaded into RAM, but that may infringe copyright – so MGT won't encourage it.

Instead MGT is developing a new fast BASIC, in 32K of ROM, which can theoretically run programs up to 750K long! This part of the project is probably furthest from completion, and will take several months to sort out. BetaBASIC author Andy Wright is helping MGT develop a new ZX-compatible SuperBASIC.

In theory, SAM could be sold very soon as an upgrade for the Spectrum + or 128K, taking over the keyboard and ROM but disabling the rest of the computer. This seems an inefficient option, but buying SAM to use like this will probably be the fastest way to get your hands on the new machine.

Amstrad stays cool about the prospect of SAM: 'Commercially speaking, I don't think it would have any effect' on sales of the company's Spectrum range, says Amstrad marketing man Anthony Sethill.

But SAM is just what the Spectrum needs. It will inject new enthusiasm into the market, software houses and even magazines! The next few months will be crucial, and CRASH will keep you in touch with SAM □

when I tried it, even with turbo loaders.

There are separate outputs for RGB monitors, video composite monitors, UHF TV and line-level sound.

There's one 9-pin joystick port, simulating keys 6-0, and the logic contains pulse counters so that the same port will work with a mouse, as on the Atari ST.

The last connector lets you plug in a light pen. Registers on the logic array tell you exactly where the TV display is being scanned at any instant; they freeze when the light pen detects the spot on the screen, so you can tell exactly where it was pointing. If you haven't got a light pen, or don't want cramp, you can use the registers to avoid graphics flicker.

SOUND OPTIONS

The sound chip in the SAM prototype is the same as in the 128, but it uses different port addresses, so it doesn't recognise three-part music in games designed to use the 128's AY-3-8912 chip. This could be fixed, but at the moment SAM's designers would prefer to use a better chip.

> "SAM is just what the Spectrum needs – and the next few months will be crucial"

Their favourite is the Yamaha SAA1099, a stereo sound chip with an eight-octave range. It can play up to six notes and two 'noises' at once, through independent stereo channels. It outperforms the AY-3-8912, but still has a 'computer organ' sound. I'd be more impressed if they'd put a simple 8-bit digital-to-analogue converter on the board, like the output stage of a SpecDrum or Sampler, as explained elsewhere in this Tech Niche special.

Whatever the sound chip, single-channel 48K sound effects will work on SAM just as normal. Sound is replayed through the TV speaker. Like a 128, SAM does not contain a loudspeaker – or even a quiet one!

DISK OPTIONS

The disk system for SAM is still under wraps, though the interface is already designed into the logic array.

The system is based on MGT's Plus D, reviewed in last month's CRASH, but uses new quad-density 3.5-inch disk drives. These use normal disks but pack 1560K into each one, reading and writing twice as fast as the Plus D and Swift Disc and about five times faster than Amstrad's +3. MGT intends to sell this drive as an optional add-on, at the same price as the computer: £99.95

MGT – FROM SPECTRUM TO SAM

When Miles Gordon Technology was set up in 1986 to build SAM, there were several groups designing Spectrum clones. At first MGT was just two people – Bruce Gordon, a Scots hardware-designer with more than 20 years' experience designing computers and interfaces, and Alan Miles, a former teacher and manager.

In the mid-70s Gordon ran his own firm making word processors. When micros arrived he switched to Spectrum developments, selling the Gordon Microframe – the first incarnation of the Disciple interface.

Alan Miles spend the 70s in teaching and publishing. He joined the micro industry in 1983, selling thousands of computers into the Middle East.

MGT was born after the shake-out in 1986 when Sinclair Research sold out to Amstrad, giving Amstrad rights to manufacture the Spectrum. MGT started work on SAM very quickly, but early efforts were concentrated on the Disciple, a multipurpose Spectrum interface. The Disciple is still on sale, and includes several features that are now part of SAM.

Late last year Bruce Gordon designed the Plus D, a £50 disk and printer interface which MGT sells directly (it was reviewed in last month's CRASH). Now the profits from Plus D sales are financing the development of SAM

SAM SPECIFICATIONS

Processor: Zilog Z80B, running at 6MHz (uncontended)

Keyboard: 48 keys, similar to Apricot in feel

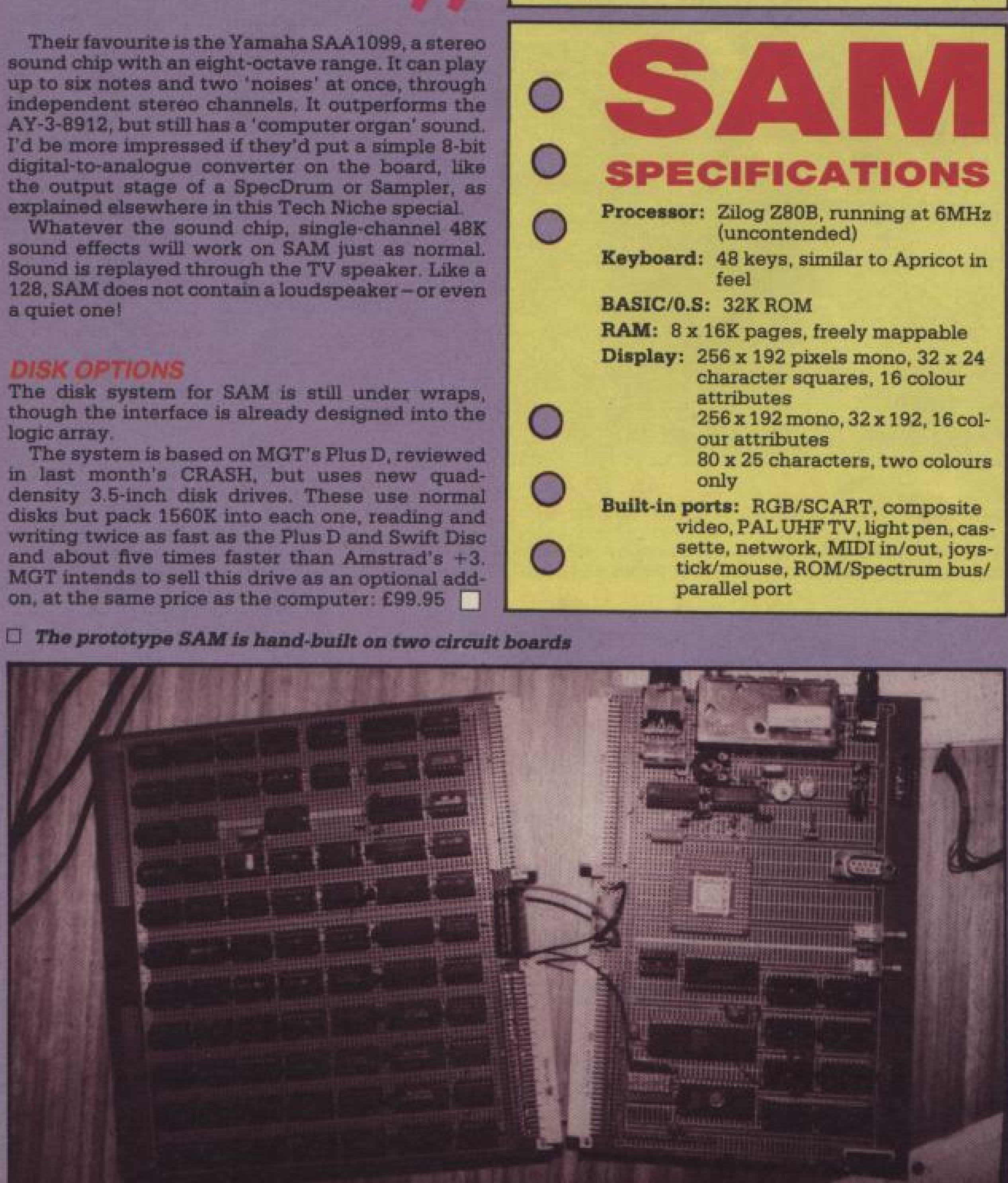
BASIC/0.S: 32K ROM

RAM: 8 x 16K pages, freely mappable

Display: 256 x 192 pixels mono, 32 x 24 character squares, 16 colour attributes
256 x 192 mono, 32 x 192, 16 colour attributes
80 x 25 characters, two colours only

Built-in ports: RGB/SCART, composite video, PAL UHF TV, light pen, cassette, network, MIDI in/out, joystick/mouse, ROM/Spectrum bus/parallel port

The prototype SAM is hand-built on two circuit boards



SO

MASSIVE BETABASIC 4

IF you're frustrated by the limitations of Spectrum BASIC and you'd prefer a larger, more structured set of commands, **Betasoft**'s BetaBASIC is probably the answer. It's a massive package, so this is just a brief summary.

BetaBASIC is a £16 extension of ZX BASIC rather than a new interpreter. It adds more than 100 new commands to Sinclair BASIC, and speeds up some of the old ones – such as GOTO, GOSUB and FOR loops. It runs on any Spectrum apart from the +3, though there should be a special version for that machine later this year.

But BetaBASIC is BIG! It consists of 18K of code on a 48K Spectrum, leaving you with about 22K for your program. The extra commands for the Spectrum 128K take up another 7K, leaving you only 15K. The compensation is that often one BetaBASIC command can do what would otherwise have taken dozens of lines. (You can also store up to 70K of array variables and routines in the 128's instant-access RAM disk.)

VERSATILE EDITOR

The BetaBASIC editor is a fast, improved version of the 48K Spectrum editor, rather than the slow, clumsy screen editor that normally runs in 128 BASIC. You can type commands in full, use an extended version of Sinclair's keyword-entry scheme, or mix the two – entering the commands you can remember as single-keypress keywords, and typing the others in full. User-defined keys are also allowed.

You can renumber, move, delete or copy any section of a program. There are search and replace facilities, and you can join and split lines easily.

Procedures and functions are allowed, with no restrictions on parameter-passing or local variables other than available memory. Block IF THEN ELSE and DO LOOPs are allowed, but there's no SELECT or CASE statement other than the old-fashioned and error-prone ON GOTO and ON GOSUB.

Array commands let you sort, search and shuffle entire arrays or slices very quickly. There are 30 new functions to convert, combine and format numbers or strings.

CRASH REVIEWS

OFTBUT STRONG

Power to the programmer from software tools

BetaBASIC's graphics commands are faster and more flexible than ZX BASIC's. Besides using faster versions of the standard commands you can define windows and FILL any shape; graphics operations are particularly fast in the 128K program. Flexible scrolling and new character sizes are supported.

A souped-up BEEP command for 128-users lets you use the full potential of the AY-3-8912 sound chip. Sounds are queued, so your program carries on running while a tune or sequence of sound effects is played. This is a vast improvement on Sinclair's weedy PLAY command, though it's a bit harder to use. And PLAY, like all the other Sinclair commands, is still available if you want it.

Since Tech Niche last reported on BetaBASIC, the software has been improved to trap errors generated by the Disciple and Plus D disk systems as well as BREAK and other standard reports.

Software-designer Andy Wright says he's been encouraged by 'lots of post' about the +3, and intends to get down to work on a new version soon. He plans to implement serial data files on the +3 disk, and ideally random-access files as well, but he can't think of much else that isn't already done by BetaBASIC 4.

Betasoft has moved: its new address is *24 Wyche Avenue, King's Heath, Birmingham B14 6LQ*

CP/M & BASIC IN A +3 PACK

+3-OWNERS can soup up with Spectrum CP/M and Mallard BASIC, steaming in soon from **Locomotive Software**. If all goes well, there'll be a March launch for the £30 disk package including Spectrum CP/M – a version of the original micro operating system – and Mallard BASIC, the 'business BASIC' supplied with Amstrad-designed computers.

Mallard BASIC is more like Microsoft's MBASIC than Sinclair BASIC – it's typically two or three times faster than ZX BASIC, with comprehensive disk-filing commands, error-trapping, and rare goodies like real-time event-handling. That means you can tell the computer to call a specific subroutine after a certain delay, or every so often, while running another program.

Mallard BASIC leaves around 30K of memory for programs and data. The interpreter and CP/M system fill the rest of the +3's 128K.

BetaBASIC still has the edge in terms of structured programming and editing commands, though it will be much easier to convert Mallard BASIC programs to run on other computers.

Once CP/M runs on the Spectrum literally hundreds of new languages will be available. Mallard BASIC will still be important, because it's a good language supplied with every copy of CP/M; I hope to have tested the whole new system in time for next month's Tech Niche

HISOFT'S HIGH-SPEED COMPILER

AT £29 HiSoft BASIC 1.2 is slightly more expensive than version 1.0, but it boasts disk commands and other improvements. The generated code is no faster, but that's no surprise – it's still the fastest integer BASIC compiler on the Spectrum, with ZIP second. And HiSoft BASIC is second only to MCODER 3, a much simpler product, when it comes to floating-point maths.

Both the minor bugs in version 1.0 have been fixed in the new version.

ADDED VAL-UE

The first enhancement of version 1.2 is an improved VAL function, similar to that of HiSoft's other compiler, *The Colt*. Version 1.0, like most Spectrum compilers, only allowed you to take the VAL of a string of digits, whereas the interpreter can work out the value of any expression – even if you include function calls and references to variables in the string.

If a compiled program handled VAL like the interpreter it would need to compile the expression every time VAL was called. This would be horribly slow and clumsy – you'd need the entire compiler loaded, along with the temporary data it generates when allocating space for variables, whenever VAL was going to be used. And as soon as you'd generated the code for each call you'd have to execute it and then throw it away!

HiSoft doesn't go to that extreme – this compiler calls the Sinclair BASIC interpreter's VAL routine from compiled programs. VAL is as slow as ever after compilation, but no extra code is needed to work out the value of functions, calculations and variables.

The snag is that variable and user-defined-function names used in VAL refer to the current ZX BASIC program variables – not to variables in the compiled program. The new VAL is an improvement over version 1.0, but still a compromise of speed, conciseness and compatibility.

FILES

For some reason Amstrad didn't put any facilities to handle text files in +3 BASIC. You can SAVE and LOAD individual arrays, but you can't handle files that won't fit in memory (there's no such restriction if you're using microdrives or third-party disk systems such as the Disciple, Discovery, Plus D and Swift Disc).

But HiSoft has fixed this +3 limitation in its BASIC compiler. You can OPEN and CLOSE text files, and then read and write them with INPUT, INKEY$ and PRINT. The syntax is simple and standard.

There are limitations – you can't wind back and forth in a file, though +3 DOS theoretically allows random access, and you can't detect the end of a file unless you read the data one character at a time with the slow INKEY$ function. INKEY$ returns an empty string when the end of a file is reached.

File-handling only works if you run the compiled program on a +3 and load the few hundred extra bytes of code supplied in a file called RUNTIME. Programs that don't use files will run independently on any version of the Spectrum.

EASY TO USE

+3 HiSoft BASIC is very easy to use, with a menu of single-key compilation options.

The compiler and menu fit into the parts of the 128K memory which are not normally available to BASIC, leaving 42K of space on drive M and about 40K for ▶

your original BASIC and the compiled code. If you're really pushed for space you can compile the code and DATA separately; this is a fairly painless process on a disk system.

Version 1.2 comes with the same demonstration programs as 1.0, plus two simple but neat BASIC arcade games. The games are limited graphically, as they rely on redefined character graphics, but they're a good starting point for learning how to write games.

The first game, a *Pacman* clone, starts life as 6K of slow BASIC and compiles into 9.5K of machine code in 9 seconds. The compiled code draws the maze eight times faster than the ordinary BASIC game, and moves the man and the monster about 6.5 times faster.

The second example, a 7.5K BASIC *Frogger* game, compiles into 10K of code in just 8 seconds. The speed-up is smaller, as *Frogger* reprints most of the screen regularly, but it still makes the difference between a slothful game and a playable game.

These results are quite impressive, though you shouldn't read too much into ratios for a couple of programs. Code that relies on integer arithmetic, rather than relatively slow graphics, can go hundreds of times faster after compilation.

> HiSoft BASIC was highly recommended for the old Spectrum – on the +3 it's even better

But at the opposite extreme, trigonometrical calculations are hardly accelerated.

HiSoft BASIC was highly recommended for the old Spectrum. On the +3 it's even better – if you program the new Amstrad Spectrum in BASIC, get version 1.2 for faster programs. For HiSoft's address, see the *DevPac* article in this section □

OLD-TIME QUALITY FROM +3 DEVPAC

HISOFT'S *DevPac* is a golden oldie. It was arguably the first 'serious' machine-code assembler for the Spectrum when first released in 1982; since then it has been revised several times, and has outlasted all competitors. And as far as I know it's the only Spectrum assembler still being marketed and developed.

It may be that most assembler programmers have graduated to other machines. Spectrum Z80 machine code is tricky stuff, with lots of restrictions and inconsistencies, especially when you compare it with the machine code of the 68000 processors in more recent machines.

But Spectrum programmers who want speed must still write in Z80 code, and they should have quality utilities.

DevPac is a pair of programs: *GENS* and *MONS*.

GENS is an editor/assembler – it lets you type in machine-code programs in mnemonic (shorthand English) form, and then converts the text into binary code that the processor can understand.

MONS, the monitor/debugger, lets you test machine code interactively.

DevPac 5.1 is supplied on one 3-inch disk, like HiSoft BASIC. It's easy to make a backup copy on another disk, as all the files will fit on the RAM disk.

Version 4.1, for earlier Spectrums, is much the same as 5.1 but works with microdrive or cassette rather than disk, and ignores the extra RAM of a Spectrum 128K.

DevPac does not come with any example files; the manual includes a worked example illustrating the use of *GENS*, but no example explaining *MONS*.

PAINLESS EDITOR

GENS, the program-generator, lets you type in up to 30K of program text in one lump on any Spectrum. This is enough for between 2K and 5K of machine code, though you can compile larger programs from disk, as explained later.

There's no fixed relationship between the size of an assembler program in text form and the corresponding machine code. The ratio depends on your programming style, and whether or not you include comments so you can understand what you've written when you come back to it after a few months.

Editing is fairly painless if you're used to line editors in the style of CP/M's ED or Microsoft BASIC's EDIT. Lines are stored in numeric order, and can be edited individually by moving a cursor back and forth along the line in a variety of modes. This is no substitute for a screen editor, but it's not too hard to get used to and doesn't need much code, leaving extra space for text.

The display can use standard 32-column text or a compact but readable 51 characters per line. Assembler programs are written in five columns – line number, label, instruction, operand and comment – so I prefer the 51-column display even though it's a bit slow, taking about four seconds to redraw the whole screen. Groups of spaces are compressed into a single byte when a line is stored, saving memory.

The cursor keys have rather arbitrary effects – the right arrow is a tab key to skip between columns, but the left arrow throws away the entire line. The up and down arrows don't appear to have any effect at all!

The editor includes a full set of multiline commands, including automatic line-number generation, renumbering, searching for text – you can replace it with something else – block printing, deleting, saving and loading. Files can be stored and catalogued on disk, tape and RAM disk.

SLOW ASSEMBLER?

GENS can translate your completed program into code at about 50 lines a second, if the program text is already loaded. That may seem rather slow, but it won't bother you if you only assemble a few hundred lines at a time.

If you want to assemble a big program you must split the text into several files and tell *GENS* to read the text from disk rather than from RAM. This slows things down even more, especially as *GENS* has to read the entire text twice. Version 5.1 assembles about 309 lines a second when reading text from RAM disk, and 20 lines a second from floppy.

If you're really prolific you can spread a program over two drives and the RAM disk, so there's virtually no limit on the size of program you can assemble if you're willing to wait: a 16K program could take about 7 minutes.

The assembler has some professional facilities. You can use macros with parameters: in other words, you define new symbolic commands that stand for a group of instructions of your choice, saving typing and text space. Whenever you write a macro name *GENS* inserts the whole group of instructions, plugging parameters in as required.

You can also imbed calculations and conditions in the code, so that a change at the start can turn any part of the code on or off. This feature, known as 'conditional assembly', is useful if you want to maintain one file of code for several slightly different systems or need to switch features on and off easily.

LIMITATIONS, FRUSTRATIONS

Unfortunately, you can't refer to other macros inside macro definitions, or put conditions within conditions. These are serious limitations, because they make it hard to take a consistent, structured approach to your work.

It's also very frustrating that *GENS* ignores characters after the first six when comparing names in your program, and insists that you TYPE INSTRU IN CAPITA LETTER (type instructions in capital letters). Ugh!

GENS produces a detailed listing when assembling, with page headings and code values. The actual code can be stored in RAM or a file. *GENS* may issue error messages during each of two passes from the beginning to the end of your program; but I'd prefer to have all the reports at one time, in order.

Errors are reported by number, rather than explained in English. This is frustrating at first, but at least it leaves extra space for your program.

TESTING PROGRAMS WITH MONS

You use *MONS* when you've written your program and want to test it. Assembly language gives you a great deal of freedom of expression, so it's easy to end up with a program that assembles perfectly but won't work as expected.

The Spectrum can execute almost a million machine-code instructions in a second. Inappropriate instructions usually crash the machine, and you must then reset and reload all the memory before trying again. It can be very hard to track down the errors in machine code, and that's where *MONS* comes in useful.

MONS stands for 'monitor' – it lets you analyse machine code and step through it at your own pace, checking the effect of each instruction. *MONS* shows you the contents of memory and registers (stores inside the processor) so you can tell exactly what's going on at any time.

The program lets you search, move and edit memory, in the form of text or numbers. Numeric RAM contents are always shown in base 16, known as 'hexadecimal' or

'hex'. This means numbers appear as a mixture of digits and letters A to F! You can enter values in decimal or hex.

HiSoft's Andy Pennell defends the fixed hex output, saying 'it's a common bug in humans, not having the right number of fingers . . .'.

The +3 can handle two 'screens' internally, and *MONS* switches between them so that the monitor doesn't mess up your program display. This works well, though it would be nice to be able to turn the switching off – it sometimes causes a lot of flicker.

MONS will disassemble code properly, translating the code into a program text file that you can reload into *GENS* (the file will have labels but no comments). This is useful if you want to edit someone else's routines.

MONS always uses a standard 32-column screen. Other Spectrum packages have managed to work with more columns, and some users are accustomed to more information when debugging a Spectrum program. The *MONS* front panel looks cramped, but it works.

The monitor lets you step through programs line by line, or skip routines, or run quickly up to a certain 'breakpoint' when the monitor screen reappears.

Version 5.1 of *MONS* fits in the +3's extra RAM, using only 160 bytes in the normal 48K program area. It lets you switch through all the Plus Two memory configurations, so you can examine all the memory of the system, but you can't select 64K RAM modes – because *MONS* uses routines in the Spectrum ROM.

HiSoft says that people who want to use the 64K modes, designed for the CP/M operating system, will have to wait till Locomotive Software puts CP/M on the +3 (see CP/M & BASIC In A +3 Pack in this section) – then you'll be able to run the 64K CP/M version of *DevPac*. You'd do well to look at other CP/M assemblers at the same time.

DEVPAC – THE VERDICT

DevPac is a well-thought-out package, but it's showing its age.

To be fair, the only Spectrum package I've seen that is clearly more powerful is the 128K version of *Laser Genius*, originally from Oasis but now unobtainable.

Even so, there's room for a Spectrum assembler that's simpler and more friendly than either.

But *DevPac* seems to have the market to itself at the moment. And *DevPac* 5.1 has all the features you need to develop large machine-code programs, though assembly can be rather slow and structured programming is not encouraged.

HiSoft's address is *The Old School, Greenfield, Bedford MK45 5DE*

THE FOOD OF LOVE

Sample a byte of music . . .

AFTER five years of joystick-bashing, the micro industry is breeding a new hobby. Cheap interfaces can now convert the Spectrum and other home computers into digital sound recorders – synthesizers that can convincingly mimic real sounds.

Once a sound has been read into a computer you can manipulate it with software in a virtually infinite number of ways. The results are immediate and repeatable. You don't have to scrape strings, spit in tubes, or bash more than one key at a time.

Anyone who can hum or tap a pencil can make micro music, step by step. The only requirement is perseverance – you just keep fiddling till you get something you like.

Incidentally, we're talking about precise digital recording here – not the buzz and beep of primitive organ chips like the AY-8912 in a Spectrum 128K, but controlled replay of almost any sound you can find in the real world.

A decade ago this was virtually impossible. When the Spectrum was launched the musical equipment which today is common at £25-£50 cost tens of thousands.

MASS APPEAL

Music has (dare I say it?) more general appeal and more creative potential than arcade reaction games or the interactive fiction of computer adventures.

But the vast majority of the millions of people interested in music take a passive role. They have creative ideas, but most can't express them because they lack the physical technique.

They're drumming on their steering wheels or tapping their desk with a biro, because they can't work the complicated, unergonomic unforgiving old technology of music – the piano keyboard, instrument valves, mouthpieces, pedals and so on – or they can't work them quickly and accurately enough to get the result they want.

New machines such as sound samplers are solving that problem. In principle these gadgets are cheaper and more flexible than conventional musical machinery, and anyone with ideas can express them after a process of successive approximations.

Some knowledge of music is useful, but it just takes a little playing around to pick up enough to be satisfied by what you're doing. All that's needed is time, a tape recorder and a Spectrum with a cheap interface.

A sound sampler is unlikely to turn you into a pop star, but it's a brilliant open-ended toy.

DIGITAL RECORDINGS

Two principles are at the core of this revolution: the first is digital recording, or sound sampling. (The other is step-time – discussed later.)

Any sound can be represented as a wave – a fluctuation of air pressure. Microphones detect these waves, and convert them into changing currents. Loudspeakers convert currents back into waves.

A digital recorder consists of a conventional computer, with a processor and memory, plus two extra parts.

An analogue-to-digital converter measures the intensity of a fluctuating current, many times a second, under program control. The resultant stream of numbers is stored in computer memory.

A digital-to-analogue converter changes numbers back into current, which can be amplified and played through a loudspeaker – reproducing the original sound.

The quality of this process depends upon two things – the rate at which you test and store the input, and the accuracy with which you measure it.

A compact-disc (CD) player uses 44,100 measurements every second, fitting each 'sample' on a linear scale of 65,536 possible volumes.

Spectrum samplers use a similar sampling rate to CD, but are less precise. Exact speeds vary, but all the units reviewed in this article are 8-bit ones that recognise a range of 256 possible volumes.

The restricted range saves memory and makes hardware and software much simpler. As long as you adjust the recording level to make sure that the input signal uses most of the available range, the quality is quite good – comparable with a portable cassette or AM radio. Indeed, 8-bit devices are still sometimes used in recording studios.

If a signal attempts to go outside the allowed range the limits of the wave are cut off, using clipping – the sort of distortion you hear when you overdrive an amplifier.

If the signal is too weak you will hear quantisation noise – a crackling sound during quiet passages, caused by inaccurate conversion of the original signal. The diagrams illustrate each effect.

CRASH REVIEWS

Datel Digital Sound ..... Issue 17
..... upgrade Issue 36
Cheetah SpecDrum ..... Issue 27
RAM Music Machine .. Issue 34
Cheetah Sound Sampler ..... Issues 34-36

DATEL'S FATAL AMBITION

*The first Spectrum sampler was Datel Electronics's **Digital Sound**. It was a noble effort, but much too ambitious – it came with programs to record samples individually and in groups, to play samples in real time, and to sequence them. Unfortunately the programmer fell out with Datel during the development and the software turned out only half-baked, or 'rather inadequate' as Jon Bates put it in CRASH!*

The Digital Sound sampling hardware is simple and a little noisy, but it works. You plug a microphone or other sound source into one mini jack socket, adjust two screws to set the input level and the amount of feedback from the output to the input (for repeat echoes), and get a line-level signal from another minisocket. At £35 the Datel is the cheapest Spectrum sampler, and worth considering if you intend to write your own controlling software

BEST—SELLING SPECDRUM

Cheetah's ***SpecDrum****, the best-selling Spectrum sampler so far, can only replay samples. The SpecDrum is really a digital drum machine with a sound that would not disgrace single-purpose drum machines that cost hundreds of pounds. Results can be excellent, even if you're not a real drummer – yet the SpecDrum costs only £25-£30.*

When Interface fanzine editor Lucian Randall played five people a tape of some SpecDrumming, none of them guessed a home computer was involved. One person still refused to believe it when he said that the recording had been made with a Spectrum, and no-one estimated a price under £100.

The SpecDrum can play up to three samples accurately at once; normally they all come out through a single phono lead, but you can record drums separately, in synchronisation, by taking a nonstandard timing pulse from the computer's cassette port. Thus you can use up to 16 drums in stereo recordings, using a couple of stereo cassette recorders. If you've got a multitracker, so much the better.

The Specdrum can store up to 16 songs in memory; each is made up of 64 numbered patterns, repeated in any sequence. Patterns can use normal or weird time signatures – 11/8 is no problem! – and each beat can be subdivided up to 32 times.

And the speed of the rhythm is easily changed, over a range so wide that even the restriction of 32 divisions per beat becomes unimportant.

You can enter drums one by one in real time, inserting or deleting thumps with two keys, or you can type in patterns by editing a grid.

The SpecDrum comes with ten drum samples and 11 demonstration rhythms. It runs at 20,480 samples a second. It can hold eight drum seconds at a time in memory, and you can choose these from a wide range.

And Cheetah's machine has a large repertoire of prerecorded sounds – tom-toms, snares, bass drums, hi-hats and most other percussive noises – but there's no crash cymbal sound, because the software uses fixed areas of memory to store samples and there isn't enough room for such a long sound. (Kits of eight extra samples cost between £4 and £5 – Cheetah has produced Latin, Electro and Afro kits.)

The prerecorded samples are recorded very cleanly, without echo; this means you can do a lot with them, but it's important to add some sort of reverberation when you record them, or you may get a rather flat sound.

There's a SpecDrum sound editor on the CRASH Tech Tape, and four exciting new samples. The samples were professionally recorded in a studio by the SpecDrum's inventor, ***Alan Pateman****. They load directly into the SpecDrum software – and you can also convert them to work with the RAM Music Machine by running another utility program on the Tech Tape*

CHEETAH SOUND SAMPLER

Cheetah, of SpecDrum fame, also produces a £45 sampler. The ***Sound Sampler*** *lacks the MIDI port and sequencing facilities of the Music Machine, but sounds a little better. It can record at two speeds: 17,500 or 35,000 samples a second – the latter close to CD speed.*

You get a small microphone with a mini jack plug that fits the input socket on the Sampler box. Both input level and feedback can be adjusted, though the control knobs scrape against the top of a Spectrum +2 if you plug the sampler straight into the back. The output comes from a phono plug on a 2-metre captive lead.

The sound sampler can use the extra memory in a Spectrum 128K to store samples, unlike the other packages, which only use 48K. It also lets you write files to microdrive as well as to cassette. The only way to replay samples is to play the computer keyboard like a small piano, unless you buy a £10 System 2 add-on program to convert or create samples for the SpecDrum.

The software is plain but functional. You're required to set up loop points within a sample, so that a section in the middle plays repeatedly if you hold down the note key. This gets around the problem of higher pitches playing more quickly and running out before you release the key.

The second half of the package is a real-time sound-effect program. This lets you add echo, reverberation, pitch shifting, chopping or 'bubblizing' effects to whatever sound you feed in. The sound quality is a bit noisy, but the effects are fascinating to play with

RAMPACKED MUSIC MACHINE

The £50 RAM Electronics ***Music Machine*** *is an impressive device, designed by ex-Sinclair Research staff, but it's rather let down by the accompanying software.*

The Music Machine is a sampler, drum machine and MIDI interface. It can record and replay digital sounds at 19,444 samples a second, and control any MIDI synthesizer. It comes with eight rather poor drum sounds, and a small microphone so you can record better ones yourself.

Three standard DIN sockets provide the MIDI facility. The sound comes out of phono and stereo headphone sockets, and there's a mini jack socket for the microphone. A sliding level knob gives you a limited amount of control over the sensitivity of the input.

You can play a sound in real time by pressing one of eight keys – or you can play one sound over a range of pitches, using the keyboard like a piano. But if you want several sounds at once you must work in step time.

You're allowed two musical sounds at once, or three drums at fixed pitch, but the Music Machine hardware can't play both music and drums at the same time. You can direct the music to the MIDI port so that your synth will play along with the drums, in two-part harmony. And you can't control more than two notes at a time with the MIDI port – a severe and needless software restriction.

The sampled sound quality falls dramatically if more than one drum or note is played, as – unlike the SpecDrum – the Music Machine handles multiple sounds by playing short bursts of each sound and hoping they blur together.

The Music Machine manual promises new software from RAM itself, but the company has rather short-sightedly scrapped that idea and encouraged other people to do the work instead. Jon Bates reviewed a couple of packages in CRASH Issue 46, and of course ZX-FX on the Tech Tape will work with the Music Machine.

There's a thriving Music Machine user group, centred on a magazine called RAMM!, published by Tech Tips contributor Al Straker. RAMM! is published every two months; a year's subscription costs £6. To subscribe, or to ask for further details, write to Al Straker at 19 Sandringham Road, Willesden, London NW2 5EP.

And on the CRASH Tech Tape there's new software help for Music Machiners interested in percussion – a routine to make SpecDrum samples compatible with the Music Machine

SOUND PROCESSING

It's simple to arrange software to play back sounds at different speeds; this has the effect of shifting them up and down the musical scale. Once a sound, or 'sample', is in memory it can be edited, reversed, mixed (by simple arithmetic) and manipulated in almost any way.

The memory capacity of small computers limits the duration of sound that can be recorded, but short spoken phrases, percussion noises and most keyboards sounds will fit into a home micro, from which they can be replayed in hundreds of different ways.

The CRASH Tech Tape includes a small program, *ZX-FX*, which shows how easy it is to process sounds with a computer. *ZX-FX* works with any Spectrum sampler, and demonstrates three simple, adjustable effects – echo, vibrato and a noise gate, which only passes sounds above a certain level, cutting out background hums and buzzes.

And *ZX-FX* uses a neat trick to avoid clipping and quantisation noise. If the level sample stays at either end of the allowed range, indicating an overload, *ZX-FX* puts coloured bars in the border of the screen. Slight overloads put rare flecks of colour in the border, and severe clipping is indicated by a flood of colour.

Thus you get a visual display of the proportion of distortion being added. This is very useful when you're busy recording something, mixing in effects to build up the sound.

You can set things up quickly by sending the loudest signal you plan to use and adjusting the level to give a very small amount of colour in the border. On an 8-bit system it may be better to accept a little clipping than to guess at a lower level; unless you're careful, quiet sounds can easily be crunched by quantisation noise just when the distortion is most obvious.

Sound processing programs must be written in machine code – they need to go very quickly and smoothly, so that lots of separate samples merge into a convincing continuous sound. But the programs can be very short – 15 or 20 lines is enough to get interesting effects. The machine-code part of *ZX-FX* is written in REMs in the program, so it's easy to see how it works.

When you start to use *ZX-FX* it asks you to enter the port numbers your interface uses for triggering, input and output. The program works with any 8-bit sampler that uses ports numbers between 0 and 255, so you can use it with almost any sampler on the market, including all those documented in the table of port details.

ZX-FX should also work with the other designs which have been published as magazine projects in the last few years. The quality of the results will depend on the filters in the sampler and their interaction with this software – so experiment!

KEEPING TIME

A small micro can work fast enough to generate echoes and other effects in 'real time' – the effect is produced as the original sound is made. But anyone who has struggled to play an entire tune in perfect time and pitch on a conventional instrument will realise that real-time music-making is often a frustrating process.

Tape recorders can freeze music, as photocopiers can freeze print, but a digital recorder can do much more – it is the acoustic equivalent of a word processor, limited in power only by its software and memory capacity.

Most digital recorders let you work in 'step time': you make up music step by step, setting the pitch, intonation and rhythm. You can change sounds, adding and deleting notes at will, with instant replay to let you know how you're getting on.

You don't have to be able to play spot-on: software can 'round' notes to whatever degree you choose.

Step time is an idea just as revolutionary as sound sampling, and it is built into most of the new music machines. Like digital sound sampling, it is ideally suited to the computer; and together, step time and sampling are a powerful duo

THEY MISSED THE CRASH TECH TAPE!

PHOTO: *Invaders From Mars*/Cannon



But you don't have to . . .

SIMON N GOODWIN introduces the CRASH utility tape – now available

THE CRASH TECH TAPE is a compendium of useful BASIC and machine-code routines, aimed at anyone interested in Spectrum technicalities – now on sale for just £5.95 (including postage and packing in the mainland UK).

Tech Tips often comes across good programs and routines that can't be printed in CRASH because the listings are too long. Other programs fall by the wayside because they only suit people with particular hardware add-ons, which is why it's difficult to find a decent printer dump for the Serial 8056 printer, or utilities for the SpecDrum, Music Machine, Multiface, or whatever.

But the Tech Tape is packed with valuable items that are too much of a minority interest to reach today's chart-dominated lowest-common-denominator market.

For instance, the Tech Tape includes a good, fast BASIC compiler. These used to be widely available at prices around £10, but now only games sell at that price; nowadays compilers have to be all-singing all-dancing programs that sell for £20-£30, or they can't get distributed.

So we've put lots of these minority routines on one tape. Some people will only want to use part of the Tech Tape, but we hope you won't mind a bit of fast-forwarding to find the bits that suit you – and that you wouldn't be able to get any other way.

The Tech Tape contents on this page was complete at the end of January, but we're trying to stick a few extras on the finished version . . .

SIDE 1 PROGRAMMING

ZIP 2 BASIC compiler

ZIP 2 translates ZX BASIC into machine code, completely automatically. In the process, it often makes programs 100 or even 200 times faster than before! *ZIP 2* has more restrictions than full ZX BASIC and full-price compilers like HiSoft BASIC, but it's much friendlier than machine code. And only HiSoft BASIC is faster.

ZIP 2 lets you take advantage of the speed of machine code while still programming and testing in BASIC. Compiled programs can be saved and run without the compiler loaded. And you can even sell programs compiled by *ZIP 2*, as long as you do not copy the compiler itself. The maximum size of compiled programs is about 12K.

The list below shows the words which *ZIP 2* can compile. If you use other words the compiler will display an error message at the appropriate point in the listing and refuse to compile the program. Some commands are slightly restricted by *ZIP 2*, as noted below.

ABS	AND	AT	ATTR	BIN
BORDER	BRIGHT	CHR$	CLEAR	CLS
DIM	DRAW	FLASH	FOR	GO SUB
GO TO	IF	IN	INK	INPUT
INT	INVERSE	LET	NEXT	NOT
OR	OUT	OVER	PAPER	PAUSE
PEEK	PLOT	PRINT	POKE	REM
RETURN	RANDOMIZE	SGN	STEP	STOP
TAB	THEN	TO	USR	

For speed and simplicity, *ZIP 2* doesn't recognise some BASIC words. But the remainder is still enough to write almost any program, given sufficient effort and forethought.

You can use up to 26 single-letter numeric variables, and 26 arrays. All arrays you use must be dimensioned – but only once, and the size must be an explicit number, not a calculated value.

The usual maths operators +, -, * and / are allowed. ZIP works with whole numbers only, between -32767 and 32767, or addresses between 0 and 65535. Brackets can be used as normal. The INT function is ignored by the compiler, as ZIP always uses integer arithmetic. But it's useful to put INT statements in your programs so that they give the same results in BASIC and when compiled. (For compatibility always INT the value produced after a division.)

PRINT always uses the top, main part of the screen. INPUT uses the bottom part. It reads numbers from the keyboard into arrays or other variables, but won't let you print messages at the bottom of the screen. If you name several variables in an INPUT statement they are set from the keyboard one by one. The only keys recognised are the digits, DELETE, ENTER and an optional minus sign at the start.

CLEAR sets array and variable values to zero. *ZIP 2* doesn't let you follow it with a number to reserve space – do that before you run the compiled code.

The check in a FOR..NEXT loop happens at the NEXT, so compiled loops are always performed *at least once* even if the start value exceeds the end. For example:

```
FOR I=2 TO 1: PRINT I: NEXT I
```

prints 2 when compiled, but nothing when interpreted. To get around the problem, use an IF test to skip over any loop which might be performed 0 times:

```
IF E>=S THEN FOR I=S TO E: PRINT I: NEXT I
```

GO TO and GO SUB must be followed by explicit line numbers, rather than calculations, so that *ZIP 2* can make them extremely fast. Even in a 17-line program, a compiled GO TO works 1,400 times faster than in its original BASIC form.

The USR function must be followed by a numeric value, not a graphic character. DRAW may be used for lines, but not curves – the ROM curve routine is just too slow and clumsy to be worth compiling.

You compile a program by loading *ZIP 2* and then the program,

testing the program in ZX BASIC (vital!) and then typing:
RANDOMIZE USR 40000

ZIP 2 lists your program to the screen quickly, pausing and displaying messages in the appropriate place if it finds a mistake. Unlike other Spectrum compilers, *ZIP 2* carries on scanning for other mistakes even after it has found one, so you can eliminate all the problems in one go.

After the listing ZIP generates machine code at blinding speed, showing you the line number and amount of code generated as it works. You can run the compiled program with:
RANDOMIZE USR 53247

If an error occurs while *ZIP 2* is running, it issues one of the usual Spectrum error reports, as listed and explained in appendix B of the Spectrum manual.

STAR BASE game

This simple game was written to demonstrate the *ZIP 2* compiler. First run it in ZX BASIC – like most BASIC programs, it's paralysingly slow. Then compile it with *ZIP 2*, and within a few seconds you've got a fast machine-code game that you can edit, soup up and recompile as you wish!

TURBO TAPE LOADER

This program by **Tom Price** extracts the Sinclair tape-loading routine from the Spectrum ROM and lets you customise it to run 50% or 100% faster than normal. You can use this utility to adapt programs to load extra fast, and can also zap the routine to change border colours, headers and other details.

PROGRAM PROTECTION

This useful machine-code routine lets you trap and analyse errors or attempts to break into any 48K ZX BASIC program.

RELOCATABLE 8056 COPY

The Serial 8056 is a popular printer, but it doesn't recognise the COPY command. Some purchasers got a machine-code routine to perform a COPY with the printer, but the routine supplied by the shops gives poor results, crashes after execution and runs at silly addresses. The CRASH Tech Tape routine runs at any address and produces much better results.

THREE IN ONE Multiface multitasking

This simple but brilliant program by **Khalid Rafiq** lets you load and run three 16K programs at the same time on a 48K Spectrum. Every time you press the magic button one program is suspended, the screen is stored and the next program appears in less than a second! For example, you can have two machine-code games on the go and program in BASIC between plays. The possibilities are endless . . .

Three In One is designed to work with the Multiface One, Multiface 128 and Multiprint interface – you need one of those Romantic Robot products. But it should be possible to convert it to work with the Mirage Microdriver, Datel Snapshot, and various magic-button disk systems, though you'll need a fair bit of technical know-how. Tech Tips can't help with conversions, but we'll be interested to hear how you get on.

NEW CHARACTER SET

. . . as seen on TV! A few years ago I programmed the credits for a Central TV series called *Magic Micro Mission* (not our choice of name!) and needed a clear, bold Spectrum character set. This set fitted the bill exactly. It was designed by **Sam Goodwin**, my artistic brother.

SIDE 2 MUSIC

ZX-FX real-time sound effects

ZX-FX shows how easy it is to process sounds with a computer. It works with any Spectrum sound sampler, and lets you play with three real-time effects: echo, which delays sounds for a predetermined period; vibrato, which causes volume to fluctuate periodically; and a noise gate, which only passes sounds above a certain level, cutting out background hums and buzzes.

ZX-FX gives you a continuous level display, to avoid distortion. If the level sampled stays at either end of the allowed range, indicating an overload, coloured bars appear in the border of the screen.

Slight overloads put rare flecks of colour in the border and severe clipping is indicated by a flood of colour. So you get a visual display of the proportion of distortion being added, which is very useful when you're busy recording something, mixing in effects to build up the sound.

You can set things quickly by sending the loudest signal you plan to use and adjusting the level to give a very small amount of colour in the border. On an 8-bit system it may be better to accept a little clipping than to guess at a lower level. Unless you're careful, quiet sounds can easily end up crunched by quantisation noise just when the distortion is most obvious.

The machine-code part of *ZX-FX* is written in REMs in the program, so it's easy to see how it works. When you start it asks you to enter the port numbers your interface uses for triggering, input and output. The program works with any 8-bit sampler that uses port numbers between 0 and 255 – almost any sampler on the market.

The quality of the results depends on the filters in the sampler and their interaction with *ZX-FX* – so experiment!

SAMPLE CONVERTER SpecDrum to Music Machine

This program can load drum samples edited out of Cheetah's SpecDrum kit and convert them so they can be loaded by the RAM Music Machine. It's an improved version of a program published in CRASH Issue 42.

SPECDRUM SOUND EDITOR

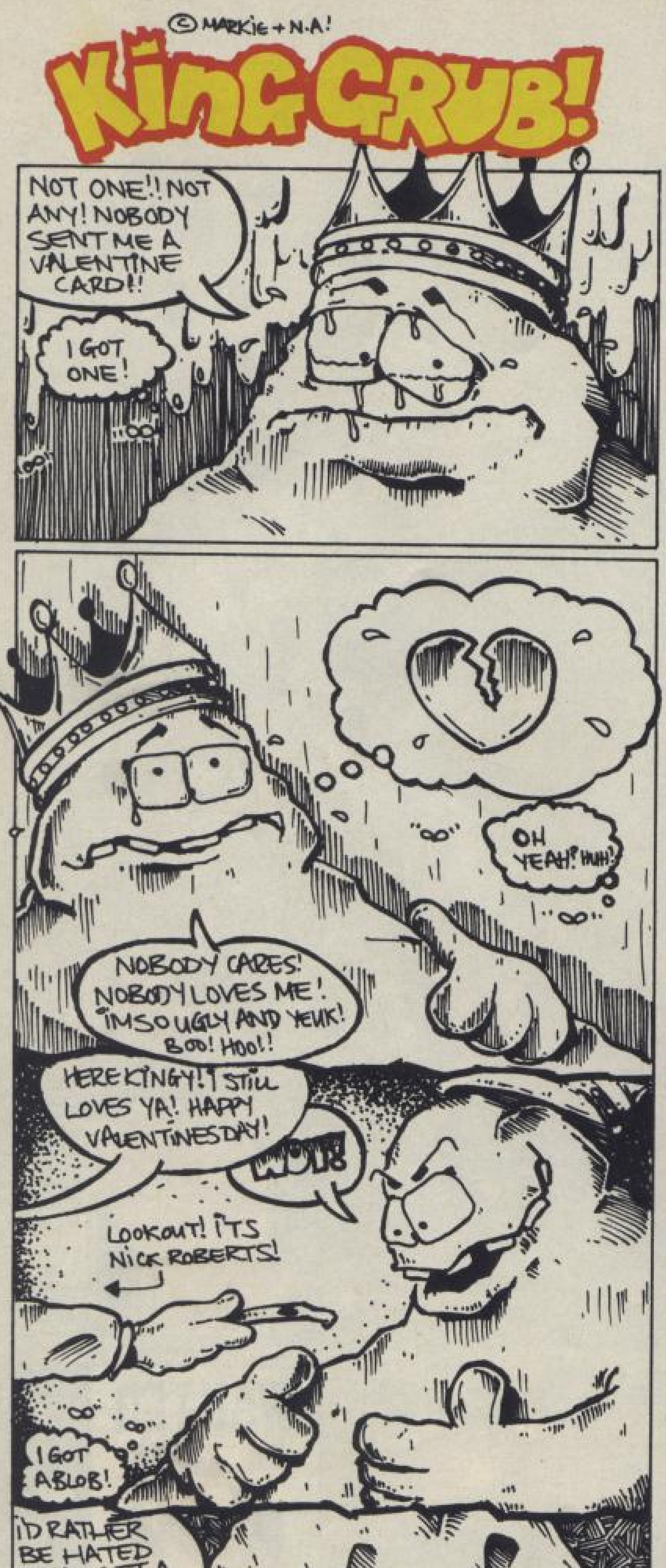
This program lets you move SpecDrum sounds between kit positions and change their relative volumes, so you can accent certain beats or adjust the balance of a kit. It's a souped-up version of a program published in CRASH Issues 28 and 29.

NEW SPECDRUM SOUNDS

These are four drum sounds produced by the author of the SpecDrum, **Alan Pateman**. They were all professionally recorded in a 24-track studio, and have never been released before: they're here by kind permission of Alan Pateman and Cheetah Marketing.

These sounds load directly into the SpecDrum software; you can also convert them to work with the RAM Music Machine by running another utility program on the same tape.

The sounds include a new snare-drum sample and what Pateman describes as an 'orchestral thump' . . .



SPECTRUM TO SPECTRUM

PAUL EVANS answers comms queries – and asks Micronet a pointed ProPak question

PRESTEL PRACTICALITIES

Dear Paul
I have wanted to join Prestel for some time now, but need a few questions to be answered.

1 How much would it cost to set myself up, including modem, membership and any plugs or sockets I may need?
2 Where would I get the needed equipment and how should I apply for the membership?

Another separate question is: are there any adventures like *Shades* and *M.U.D.* that you can play via the phone but without a modem?
Gareth Mackown, Milton Keynes

I'll answer your questions in order:

1 Costs range from £100 to thousands, but for a basic but effective setup you will need a VTX 5000 modem (for 16K/48K/128+2 Spectrums) and a Micronet subscription. Both are available from Micronet for £60 as a package: write to Micronet 800, Telemap Ltd, Durrant House, 8 Herbal Hill, London EC1 5EJ.

The VTX plugs into the BT network using the now-standard BT inphone plugs, and you will need a socket installed in your home. A set of two plus installation will cost you around £25 from your local BT dealer.

2 There is an alternative to writing to Micronet: Dixons has been known to stock application forms for Prestel. And many computer business centres will be able to give you sound advice about communications, modems and Prestel.

For advice on connecting your Spectrum to the BT network visit your nearest BT Phoneshop or dealer or write to Prestel Enquiries, Telephone House, Temple Avenue, London EC4Y 0HL.

3 The short answer is 'no'. The long answer is: why not try a PBM game? It takes longer than Shades *but can be just as enjoyable! (See Brendon Kavanagh's PBM column on page 75 of this CRASH.)*

THIS WAY FOR WAFAS

IT'S not quite comms, but . . . **Myles Dawson** wrote asking how to get a Rotronics wafadrive (which I mentioned in a ZX Microfair report in CRASH Issue 45).

Capri Marketing supplies wafadrives, blank wafas and help sheets. For more information write to Capri Marketing Ltd, *24A White Pit Lane, Flackwell Heath, High Wycombe, Buckinghamshire HP10 9HR* or phone Capri on (062) 853-1244.

TELEMAP TAKES THE WRONG LINE

TELEMAP, the owner of Micronet, has launched its own modem package specially designed for use with Micronet. It's called **ProPak** (standing for 'professional package') and comprises a Telemap BABT-approved Hayes-compatible modem with autodial, V21 and V23 protocols, software, cables and one year's subscription to Micronet, Prestel and Telecom Gold. The damage is £218.95 – a saving of around £168 on the retail prices of the package's components!

So it's a shame that ProPak is available for nearly every modem-using computer *except the Spectrum.* Perhaps it's part of Micronet's deliberate move away from older machines to an adult, ST-owning audience – more than half of Micronetters are over 30, according to a recent report. But should the network forget 4,000,000 Spectrums?

Telemap marketing services manager Lynne Thomas comments: 'With online services becoming increasingly vital to the serious computer user, we realised that a single purchase package was needed to replace the existing assortment of incompatible modems, cables, communications software and services.

'The Telemap ProPak is that complete solution,' she says, 'and at an unbeatable price.' Give me a VTX, a Speccy and a Spectre Comms ROM totalling about £90 and I'm happy at half the price!

WINNERS & PRIZES



MORE TO THIS THAN MEETS THE EYE
Issue 47

Chris Gorman from Scotland KA13 7PN came closest to correctly guessing the number of times I and i appeared on last month's first Forum page. He also came up with some very interesting palindromes for Endurance Games's *Eye* competition. And he'll be receiving a whole host of eye-related products (from an eye patch to a bottle of Oprex)!

The ten runners-up will each receive a copy of the *Eye* computer game and the official *Eye* book. Their neyemes:
Denise Grange, London SW8 4EB; Seyemon P Broder, Sunderland SR5 5BL; Keith Patience, Edinburgh EH11 3DQ; Ciaran Walsh, Dublin 14, Eire; R Stevens, Dyfed SA69 9LR; Jason Stewart, Liverpool L14 9NS; Neil Oatley, Yorks YO2 5HN; David Lane, Notts NG2 5HR; Lee Reveley, Coventry CV3 6HT; Andrew Hopkins, Bristol BS17 4HX.

PACING 'EM IN
Issue 48

The winner of the *Pac-Land* competition, **J Smith** from Sheffield S17 4QQ, has already been invited by Quicksilva on an all-expenses-paid trip to a top London arcade – and given a bagful of 10p pieces to make it a play to remember!

Ten runners-up each won a *Pac-Land* briefcase. They happen to be . . .
Paul Thompson, Portishead BS20 8HF; David Haffner, Worcs B97 6LY; Ben Wootton, Milton Keynes MK19 7AE; Mathew Clementson, West Midlands B30 2EN; Stuart Bowen, Lancs BL8 1XX; Michael Scott,Tyne And Wear NE9 7RD; R Yeung, Lancs WN6 0TG; Richard Burton, Cornwall TR12 6RB; David Johnson, Sheffield S8 9FY; Steven Lau, West Midlands B65 0EH.

WELL FED UP WITH PIRANHA
Issue 48

Stephen Hall of Bristol BS9 3LH should already be well through his Harrods School Tuck Box – the fantastically fattening prize in this *Yogi Bear* competition. He also gets a copy of the game, just like the 30 runners-up . . .
Gary Derrick, Hants PO2 0UT; David Mills, Suffolk CB8 0PD; Stephen Phythian, Merseyside WA10 6AZ; Simon Parry, Gwynedd LL61 6UW; Paul Wakeling, Leicester LE6 0DE; Michael Bean, Surrey KT17 1BY; Matthew R Binns, West Yorkshire BD13 3BJ; Miss T A Addison, Hants RG26 6UE; Brian Shepherd, Worsley M28 6TT; Haldene Butler, Northern Ireland BT79 0DH; Kevin Green, Kent BA2 0PL; Alan Thomson, Ayr KA7 4UB; Andrew Howard, Herts CM23 3LN; Edward Miller, Kent DA12 5PU; Andrew Brown, Cambs PE2 8BH; Ben Saynor, near Leeds LS17 0AN; Luke Weaver, Devon EX38 8LF; Stuart Barrett, Cornwall TR13 9QL; Andrew Kirkaldy, East Sussex TN22 5EF; Andrew Grantham, Devon EX34 8BZ; P Reynolds, Lincs NG34 8UD; D Haigh, Leicester LE8 1QG; Matthew Hogan, Kent ME13 8SY; John Burgess, Beds LU1 3NE; Shaun Hill, Kent ME13 7SH; Jonathan Whormsley, Devon EX31 3PZ; Anthony Johnson, London NW2 5TA; Phil March, Surrey CR3 3JD; Christopher Mortimer, Shropshire SY5 0RW; Mark Pearce, Devon EX16 5DB.

DASHING THROUGH THE SNOW
Issue 48

Digital Integration's *Bobsleigh* proved popular with the reviewers – so it was no surprise that the competition attracted so many entries. After all, there was a slinky designer tracksuit up for grabs. **Anna Burke** will be slinking around Birmingham B42 1PX in it soon. And 20 runners-up will, like Anna, each receive a copy of the wintry game . . .
Allan Gardner, Kent ME2 3TR; P W Foster, London SW14 8JJ; Stephen Ward, Co Clare, Eire; Charles Beddard, West Yorkshire HD5 8EE; Matthew Jones, Hants SO5 7LQ; David Hodgson, Co Durham DL4 2JJ; Jer O'Connor, Co Kerry, Ireland; John Alexander, Cheshire CW8 1LZ; Lasse Eldrup, Denmark; Mal Sims, Kent CT1 1YF; C J McCarthy, Merseyside L45 4QN; Ralf Rashbrook, Herts AL9 5DL; David North, Somerset TA20 3JN; Andrew Williams, Wales CF7 7JS; Ciaran Montague, Northern Ireland BT79 0EU; R Stratton, Wilts SN10 5JB; Victoria Sneddon, Northumberland NE24 3SP; Andrew Coleman, Birmingham B29 7PZ; D Austen, Lincs PE9 2XY; Philip Wynn, Beds MK45 4BE.

FA LA LA LA LA LA
Issue 48

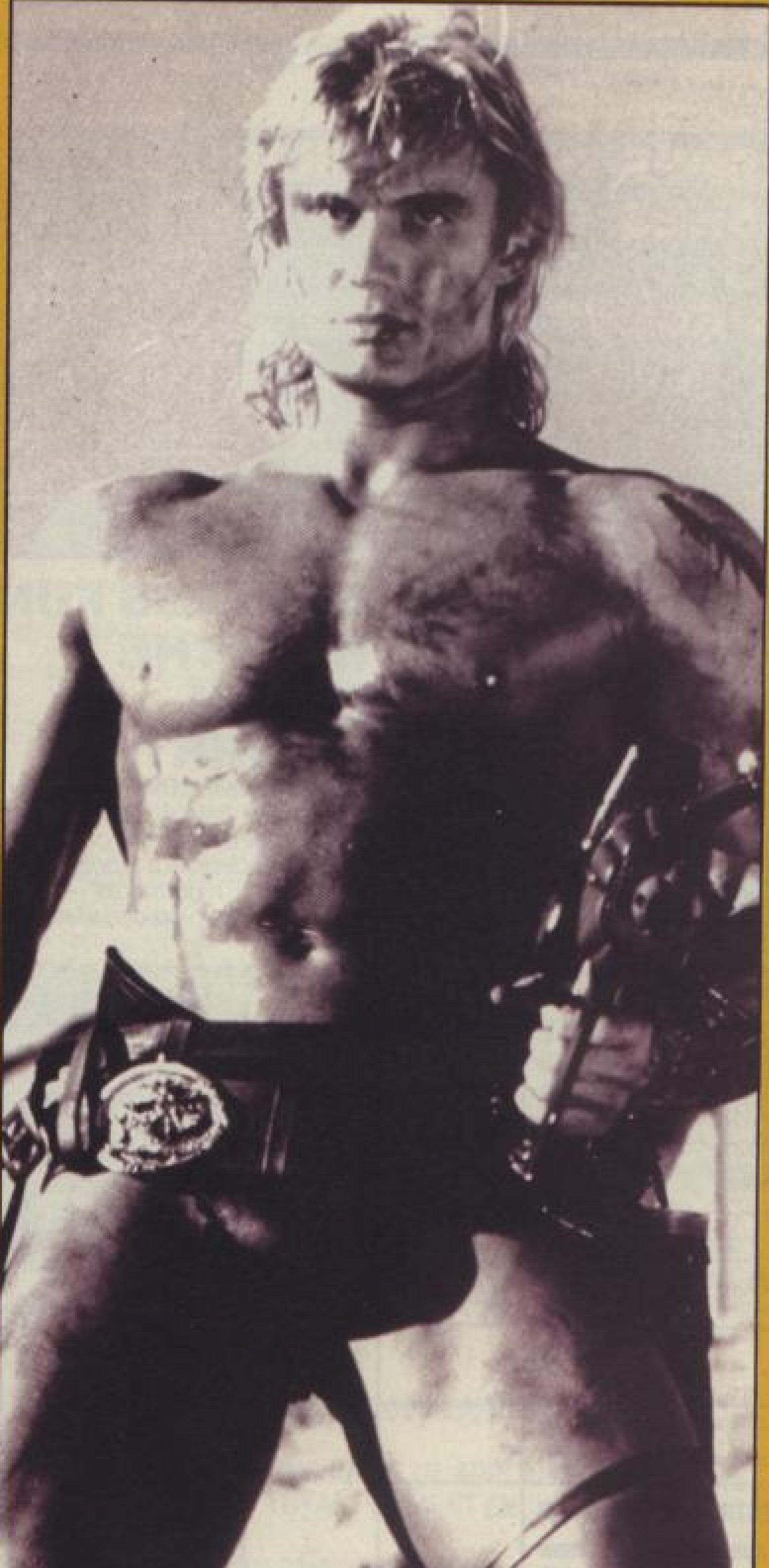
The most appropriate words for Jon Bates's Christmas carol tune came from **Sean Cooney** of County Roscommon in Eire. He gets a £25 record token and a CRASH cap and T-shirt.

CRASH AWARDS
Issue 48

We won't have the results of the 1987 CRASH Readers' Awards till next month – they're taking Franco Frey's program so long to calculate – but we had time to pick out ten lucky winners, who'll each receive a £20 software voucher and the CRASH T-shirt of their choice. The first ten out of the postbag were . . .
John Hay, Sutherland IV25 3RD; Paul Bullough, Hereford HR4 9TU; John Wood, Bucks HP22 6BS; P Wade, Bristol BS1 0EP; Nigel White, West Midlands B62 0HL; Steven Smith, Herts WD2 7EQ; William Turner, West Sussex GU29 9BT; Gary Smith, York YO4 5AR; Scott Wilding, Northants NN14 3LD; Alan Comer, Berks RG8 7LD.

LET'S PLAY BALL
Issue 48

The people of West Yorkshire WF12 7PL had better watch out for their windows in the next few months. **Colin McBurnie** from that area won the leather Tango Mundial football that CRL put up for grabs in the *Ballbreaker* comp, and 20 runners-up each receive a copy of the *Ballbreaker* game . . .
Chris Sudall, Merseyside WA11 8AY; Llifon Edwards, Gwynedd LL77 7SJ; Chris Joseph, Suffolk IP33 2PD; James Culyer, Norwich NR11 8LJ; David Menzies, Manchester M20 8JU; Alan Doggett, Ipswich IP10 0PD; Colin Johnson, Manchester M5 3JL; Chris Giles, West Yorkshire HD5 8ER; Sam Dennis, Herts EN8 9EQ; Lee Schollar, West Sussex RH11 7QR; Robin Sluyer, West Sussex RH19 3DU; Mark Tuma, Berks SL6 4DU; Mark Thompson, Bristol BS20 8HF; Anthony Gelberg, London NW11 0AU; Henry King, near Bristol BS18 8YH; R Clarke, Leics LE10 2RA; P W Foster, London SW14 8JJ; Peter Khan, Bristol BS14 0HN; Jorge Rocha, Portugal; Andrew Watts, Staffs WS14 9BA.



MASTER OF THE MOVIES
Issue 48

If **Martin Bell** of North Yorkshire HG1 3ED isn't reading CRASH at this very moment, he's probably down his local picture house using the £75 Cannon cinema voucher that Gremlin Graphics gave away in this *Masters Of The Universe* competition. The second prize of a £50 cinema voucher went to **Christian Taylor** from North Humberside HU5 3UD, and the £25 voucher found its way to **David Edwards** from Hereford HR2 9JU.

Let's hope they used the voucher to see the licensed film! 25 runners-up, like the winners, each receive a copy of the game . . .
Mark C Trotter, Bradford BD2 3HQ; Vince Yallop, Norfolk NR4 7AY; Martin McKenzie, Scotland AB5 9YL; Colin Petrie, Herts WD6 2PP; Nick Westerdale, Bucks HP6 5PL; Mark Smith, Shropshire TF9 1JT; Sean O'Driscoll, Glos GL54 1ES; Paul Whitfield, Surrey CR0 0TT; Andrew Sharkey, Lancs WN3 8AT; Gary Vickers, Lincoln LN3 5DA; Mark Healey, West Midlands WS2 0LX; Paul Rudman, Lincoln LN2 2TE; Stephen Smithhard, South Yorkshire DN5 9LF; Paul Jeffs, Cambs PE4 6HU; Andrew Marshall, Merseyside L19 8LJ; Michael O'Brian, Tyne And Wear SR5 3BG; Victoria Sneddon, Northumberland NE24 3SP; Adam Bolton, Surrey GU5 0BT; Jason Long, Glos GL5 4PE; Nicholas Young, Lancs OL3 5EG; Richard Langdon, Isle Of Wight PO37 7DF; Derek Luddem, Stockport SK4 3AA; Anthony Goddard, Oxford OX2 7TE; Desmond Burke, Birmingham B34 6AE; Andrew Gauld, Southampton SO2 4TG.

CRASH HYPERMARKET

ARE YOU IN A BIND?

If not, you could be – just wait till your CRASHes start running away! Now you can keep them bound up in a friendly but firm blue binder embossed with the CRASH crest. Each binder holds 12 CRASHes, and comes complete with a little rub-on thingummywotsit which you, um, rub on and then the binder says '1987' on the spine, do you follow? You have to be there, really.

We could go on about the handsome tooling, the embossed title page and the rare art prints which will make this a collector's edition, but it'd all be fibbing. The CRASH binder is, however, very useful for making shelves collapse when overloaded with 164-page editions of the magazine!

£4.50

ASHES TO ASHES, DUST TO . . . SPECCY?

Franco Frey's First Law Of The Impermeability Of Materials states that a specially-designed double-seamed dust cover will, when placed over a Spectrum, inhibit its tendency toward dust equilibrium with its environment. In other words, these jobs keep your computer clean, right?

The CRASH Spectrum dust covers, which are by a curious coincidence emblazoned with the name CRASH, have been made to four different sets of measurements, to precisely fit four different kinds of Spectrums: the early rubber-keyed model, the Spectrum +, the Spectrum 128 and the Spectrum +2.

And seriously, now, remember this small investment COULD save you big repair bills . . .

£3.00-£4.00

CRASH HISTORY BINDERS

Lloyd Mangram's four-part CRASH History, which continues in this issue, will add up to 96 pages: 48 CRASH covers and 48 pages of text. A special binder will be available in December to keep the CRASH History permanently together.

The binder is designed to also accomodate the complete CRASH indexes to reviews, tips and features, which will be published in the Christmas Special.

And each binder will come with reprints of all Lloyd Mangram's CRASH Lookbacks (excluding 1987, because that's in the Christmas Special anyway) and some special articles and archival material on the history of the Spectrum. With the CRASH History it will form a unique CRASH book of over 120 pages.

You can order the binder now, but please be prepared to wait longer than the usual 28 days!

£4.50

ARMLESS FUN WITH THE CRASH T–SHIRTS

***FOUR** styles! Three of them feature Oli Frey's most famous CRASH paintings in full colour and one T-shirt depicts a monster from your worst nightmares – King Grub. Wear it if you can stand the slime.*

The three covers are: Head Over Heels*'s Evil Emperor (Issue 39), a monster from Oli's interpretation of the Level 9 adventure* Red Moon *(Issue 20), and the CRASH surfer – the ultimate Spectrum sports simulator, still wet from the waves of Issue 19!*

The T-shirts are 50% cotton and 50% polyester, so everyone's happy, and they're all available in two dramatically different sizes: medium (M on the form) and Grubbish, ie extra extra large (XXL).



KING GRUB

*These T-shirts are **ONLY** available from CRASH' and you won't find the distinctive artwork on T-shirts anywhere else.*

£5.50 each



SURFER



RED MOON



EVIL EMPEROR

ITEM	QUANTITY	PRICE
T-SHIRTS .... £5.50 each		
RED MOON .... M		
.... XXL		
EVIL EMPEROR .... M		
.... XXL		
SURFER .... M		
.... XXL		
KING GRUB .... M		
.... XXL		
CAPS .... £3.95 each		
BINDERS .... £4.50 each		
SPECTRUM DUST COVERS		
RUBBER–KEYED SPECTRUM .... £3.00 each		
SPECTRUM + ... £3.25 each		
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1984

3 APR Sinclair talks to CRASH • Stack Light Rifle • Run It Again: *Missile Command* games • CRASHtionnaire results • the earliest surviving back number!!
4 MAY *The Quill* analysed • the fabled ZX Microdrive appears • Run It Again: *Pengo* games • graphics utilities • Living Guide: boardgames, simulations, strategy, adventure • the second-earliest surviving back number!! *(that's enough early back numbers – Ed)*

1985

17 JUN Denton Designs • Sinclair Story 3 • Maps: *Knight Lore, Underwurlde* • Leonardo Graphics • Datel sound sampler • Artist: David Thorpe
18 JUL Gremlin Graphics profile • Artist: Bob Wakelin • Map: *Gyron Atrium*
19 AUG CRL profile • Oliposter • roundup of BASIC compilers • Artist: Rich Shenfield • Maps: *Dynamite Dan, Shadowfire*
20 SEP Electronic Pencil Company profile • Maps: *Alien 8, Dun Darach*
21 OCT Holografix profile • Holograms • Map: *Nodes Of Yesod* • Platinum Productions profile
22 NOV Fanzine File • Microdrive tips • Artist: Susan Rowe • Fantasy Gamebooks
23 DEC Melbourne House • Computer graphics • Artist: Dave Beeson
24 XMAS 1985/6 Artist: Oliver Frey • Gargoyle Games profile • Lloyd's Lookback • Hewson profile

1986

25 FEB Durell profile • Microsphere • FORTH and extensions to ZX BASIC
26 MAR St Bride's profile • Spectrum 128 • Micronet 800 • Multiface 1
27 APR Playing Tips supplement • Mel Croucher • Imagine profile • PBM convention
28 MAY Fanzines • Martech profile • Composite Video Interface • SpecDrum
29 JUN First PBM Mailbox • Homegrown software • Realtime profile • Maps: *Cylu, Sir Fred, Saboteur, Tantalus*
30 JUL Birth of a game • Laser Genius • Maps: *Tantalus, Movie*
31 AUG Software Projects • Word processing • Maps: *Pentagram, Heavy On The Magick*
32 SEP Programmer: Dave Perry • *GAC* • Maps: *Core, Ghosts 'n' Goblins, Bobby Bearing* • Echo Synthesizer
33 OCT Programmers: Jon Ritman, Costa Panayi • Maps: *Dan Dare, Cauldron II* • SpecDrumming
34 NOV Programmer: Don Priestley • Genesis Update • Maps: *Dynamite Dan II, Equinox, Universal Hero* • Music Machine
35 DEC Designer: Dan Malone • Computer Advertising • Maps: *Glider Rider, Thrust, Lightforce* • MIDI
36 XMAS 1986/87 Lloyd's Lookback • Spectrum Music • Maps: *Scooby Doo, Heartland, Druid*

1987

37 FEB John Richardson: Jetman • CRASH Reviewers revealed • *Match Day* Challenge • Maps: *Fairlight II, Firelord, Avenger, Dandy*
38 MAR Fanzines • Designer: Bernie Drummond • Maps: *Cobra, Impossaball, Uridium* • MIDI
39 APR Arcades update • The Z88 • Programmer: Steve Taylor • Maps: *Nosferatu, Double Take, Future Knight, Feud*
40 MAY Terminal Man returns • Playing Tips Supplement • Maps: *Short Circuit, Antiriad, Con-Quest, Into The Eagle's Nest, Sceptre Of Bagdad, Dragon's Lair II, Thrust II, Fat Worm Blows A Sparky, Tarzan, Aliens*
41 JUN Programmer: Mike Singleton • Industry today • Adventure Trail Supplement • Maps: *Saboteur II, Head Over Heels* • Multitrackers • 128 bugs
42 JUL 16-page *OINK!* pull-out • *Living Daylights* film FX • Programmer: Pete Cooke • Maps: *Auf Wiedersehen Monty, Hydrofool, Rasterscan*
43 AUG The +3 arrives • Run It Again runs the *Gauntlet* clones • Big trouble at *The Bug* • CRASHtionnaire results • CRL's *3D Gamemaker* • Maps: *Enduro Racer, Flash Gordon*
44 SEP Programmer: David Aubrey-Jones on *Mercenary* • The Sega Master System • Is homegrown software healthy? • Tech Tips: that Swift Disc • Forum: *Barbarian* backlash continues • The CRASH Challenge • Maps: *Vampire, The Curse Of Sherwood* • tips galore for *Killed Until Dead*
45 OCT Run It Again: the kick-'em-ups • The CRASH History Part One • In the arcades • The budget BOOOOOOM • How stars are born: selling your games • On The Screen logo winners • Maps: *Game Over, Wonder Boy*

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Please remember you CANNOT send competition or charts entries, letters to the Forum or Playing Tips, or any other correspondence to the editorial and subscriptions departments in these Multiple Order envelopes. They're going to a different side of Ludlow!



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CRASH COURSE

by ROSETTA McLEOD



Scetlander's novel ideas include house-building, travel-agent, wildlife and road-safety packages – as well as traditional subjects like maths and biology

INTRODUCING SCETLANDER

LAUNCHED recently, Scetlander takes the first four letters of its name from the Scottish Council For Educational Technology, which now produces packages for all age groups. They come with comprehensive documentation.

The catalogue is available from **SCETLANDER LTD**, *74 Victoria Crescent Road, Glasgow G12 9JN.*

CELL GROWTH

Subject: biology
Retail price: £10
Age range: 16 years and over

THIS program, aimed at senior pupils studying for biology exams, simulates the method of studying population growth in microorganisms using the haemacytometer cell-counting technique. This method requires a great deal of expertise and Scetlander claims the program offers thorough grounding in the principles of the method while avoiding the frustrations of poor experimental results.

Students should have a fair knowledge of growth-cycle theory before using the program. There are two scenarios where the student has to take control, *Pattern Of Growth* and *Effect Of Temperature*. Temperatures, incubation periods and dilution factors must be set. Samples can be taken up to nine times.

The challenge is to construct a cell-growth graph, which is compared with the computer's own graph derived from the same data. A fair amount of decision-making is called for, and sound judgments are needed to obtain efficient cell growth.

The data collected during a session can be saved, and both graphs and data can be printed out.

COMMENTS

Though of rather limited appeal, this is a useful program dealing with a complex topic

CYCLING

Subject: road safety
Price: £10
Age range: upper primary

SCETLANDER'S road-safety software aims to give pupils confidence in recognising many Highway Code signs, particularly those relevant to cyclists. It starts off with a quiz on road signs, and then there are questions on how the cyclist should handle particular situations.

When the pupil passes the theoretical section, he can proceed to a cycling simulation on the screen. The cyclist has to look behind himself in the right places and give signals as necessary.

Cycling can print out a certificate if the pupil passes at the first or second attempt.

A practice session can be set up, and the teacher can view the pupils' responses.

COMMENTS

This attractive and useful program makes good use of colour and graphics

BASIC MATHEMATICS

Subject: mathematics
Price: £20 (for the suite of eight programs)
Age range: 10-13 years (remedial)



► *Basic Mathematics*: **the maths is there, but the screen's too basic**

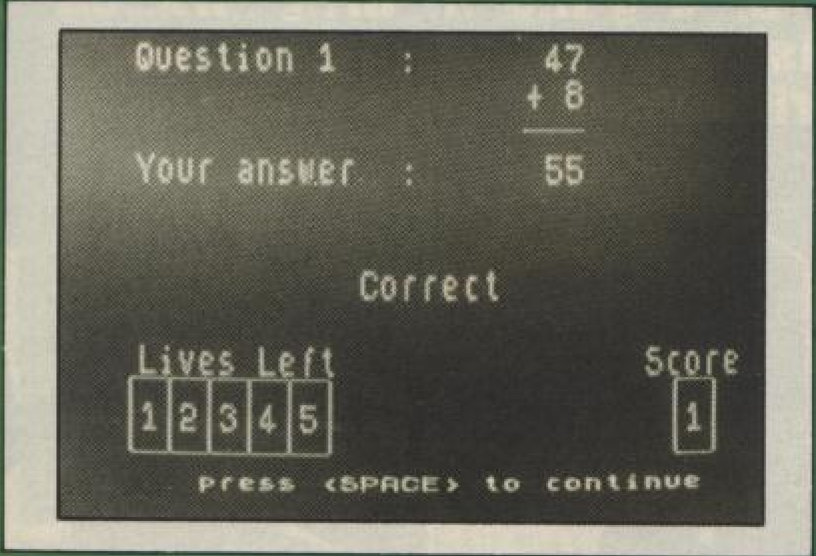
BASIC MATHEMATICS is a suite of eight programs covering a range of mathematical concepts. The first four programs are reviewed this month, and the remaining ones will appear in the next CRASH Course.

Angle Estimation gives the pupil practice in estimating acute, obtuse and reflex angles. At the start of the program, the teacher can choose the number of questions set, the type of angle which is to be drawn on the screen, the quadrant position of the first arm of the angle, and the margin of error permissible. A particularly useful feature of this package is that it can prepare a diagnostic report for the teacher afterwards.

Digit Addition is a drill-and-practice program in which the pupil has to add a single-digit number to another single-digit or two-digit number. The teacher can determine the level of the program, the layout of the problems (horizontal or vertical), and there is a scoring system where the pupil loses 'lives' after too many incorrect answers.

Unfortunately, apart from this little attempt has been made to motivate the pupil to do well. A livelier method of presentation, perhaps with a games format,





would have made this program more appealing.

Dice Multiplication is an exercise in snakes-and-ladders format. If the pupil gives the correct response to the multiplication question, he moves forward – if incorrect, backwards – and the aim is to reach the home base.

Two dice appear on the screen, and the numbers shown are to be multiplied together.

The program is flexible: it can be used at varying levels of difficulty (it goes as far as vulgar fractions and decimals). And *Dice Multiplication* is quite useful for less able pupils who need a great deal of repetitive practice, though it would be nice to have a two-player option in the game.

Better graphics and the use of a range of colours would also have made the effect more imaginative.

Fraction Identification presents the pupil with a series of shaded rectangles and asks him to identify the fraction which has been shaded from a choice of three answers. If he wishes, the pupil can choose to see some examples first before attempting the questions. The correct answer is shown on the screen if the child enters two wrong responses to a question, but no explanation is given.

Once all the questions have been answered, the computer will give details of the user's performance and can also display the scores table. The teacher can't set up the exact fractions to be practised, but he can choose the number of questions (from five to 20) or wipe out the scores table.

COMMENTS

Though they're reasonably useful examples of drill-and-practice software, these programs suffer from dullness and lack of imagination.

The only colours are blue and white, and it seems little thought has been given to making the screen displays attractive and appealing.

The subject matter could quite easily have been made more appealing to children.

SNAPSHOT

Subject: environmental studies
Price: £17.50
Age range: 8 years and over

THIS environmental-studies program is envisaged as a starting point for a wide range of activities on wildlife. The object is for the pupils to discover as many animals as possible (there are 13 all told) and to take pictures of them in their habitat – all within the program.

The pupils should attempt to use the least number of exposures, and compile an information folder on the animals.

The pupil starts off with a map on the screen, and a newspaper which provides clues on the haunts of the animals. The pupil travels round the scenery, using north, south, east and west commands.

When the pupil finds an animal, the P key opens the shutter, and the picture comes up onscreen.

As in all good computer games, there are obstacles – the landscape is dotted with trees, houses, water and hills, and gates have to be opened and closed. And if there are crops growing in the fields, the pupil has to walk round the edge.

Snapshot is an obvious stimulus for work on mapping skills, and the teacher's notes give other good ideas for using the program in the classroom.

COMMENTS

This imaginative and enjoyable program can help motivate development of a range of skills in the areas of language, environmental studies and maths – highly recommended

HOLIDAY

Subject: language/environmental studies
Price: £15
Age range: 10 years and over

IN *Holiday*, a simulation of a travel agency, pupils find suitable holidays for imaginary clients.

There are three resorts available in each of five countries: France, Spain, Italy, Greece and Austria. Some resorts are quiet and secluded, while other have good shopping centres and a great deal of nightlife. Travellers can set off from Glasgow, Edinburgh, Manchester or Luton airports, though many of the seats in the planes have already been claimed by other travel agencies.

Pupils can call up all the price information, and book individuals or parties for half board or full board as required. Going off season is, naturally, cheaper than going at the height of the summer.

The computer tots up the full cost of the booking, and the teacher can increase the prices as inflation inevitably takes its course.

When the pupil's client has found a flight and a resort with acceptable prices, a booking can be made. A Display Bookings option allows the user to look at all the bookings which have been made, and to do a search for a particular reservation.

COMMENTS

This package is an extremely flexible resource for the teacher, and integrates usefully into an area normally covered in the upper primary

COMMENTS

The excellent teacher's notes give several ideas for using this package in a holiday project – and I can vouch for its quality

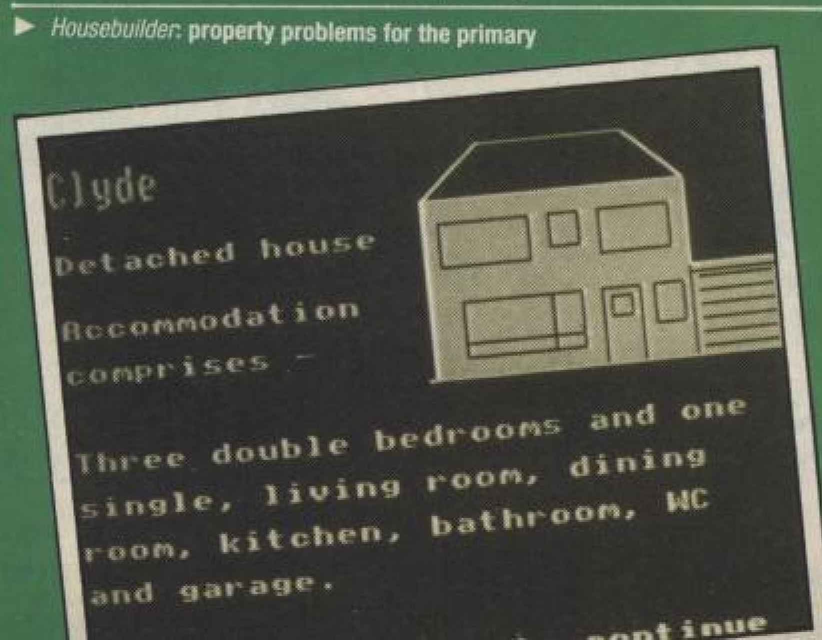
HOUSEBUILDER

Price: £12.50
Age range: 10-year-olds

HOUSEBUILDER simulates the role of a small builder in making decisions about the choice, pricing and siting of houses. The pupil has to examine the site (four are available), choose the types of house to be built from eight possible designs, and decide whether to let or sell the houses. If a house is to be sold, obviously, a price has to be fixed.

A good many factors must be assessed in this house-building exercise. Early in the proceedings, one has to decide what sort of social mix is going to be created on the new estates.

► *Housebuilder*: **property problems for the primary**



1987 PBM MAILBOX



READERS' REVIEWS

BRENDON KAVANAGH reaps the fruits of some letter-writing with two readers' reviews of Shattered World. **It's got no better since their first reviews in Issue 44 . . .**

SHATTERED!

The rulebook and map provided by the GM are quite good and the map is especially attractive. The cost of the game includes a stamped envelope for returning orders, which is a nice touch. The newsletter doesn't impress me, but it's new and I expect it to improve.

Diplomacy in the game I am in indicates that players are pretty young. They're not the most interesting or subtle communications I have received! I find the combat and monster routines quite boring and the game content in general has unfortunately disappointed me.

Perhaps there is a good game hidden in there somewhere (the idea of a destroyed world with the odd ancient artifact lying around to use and abuse in order to remove the other players is always an interesting idea), but it is not for me. I had hoped that continued playing would give something good to say about *Shattered World*, but this is one of those games which get so dull I don't rush to look at the turnsheets when they arrive.

I cannot get into the game, but possibly younger players or those new to the hobby will find more to enjoy in it.

ANON I

Shattered World is basically about moving a small number of units around a hexagonal map of hexes (!), searching for crystals to return to your tentralith (command module) and fighting units and monsters you come across. You automatically fight all other players as you meet them, except those you have declared as allies on your order sheet.

Conflict with other players is simple, on a stacking algorithm: the more units you have on a hex, the more power you have, and some units being more powerful than others. Battle reports are fairly simple, giving the types of units and their owner.

Fighting with monsters is similar, but the problem here is there's no information when the battle is lost. For example, a battle with a monster which you lose will appear on your printout simply as 'Your unit commanded by . . . has been destroyed by a monster' – no information is given as to where on the unit's course it happened. The GM's explanation is that when your unit is destroyed all communication is lost; but this seems something of a cop-out. My first confrontation with a monster was in the middle of a desert and I'm sure my unit commander would have been able to see anything coming which was large enough to destroy him and his radio!

Not much else happens in *Shattered World*. All you can do is move your units around and explore, build new units, collect crystals and fight with monsters and other players. Diplomatically, you can send a message through game control to any player by just sending it to a player number or name (they're all listed at the top of the turnsheets). This seems at odds with reality – I would have thought that having to know the player's name through a game meeting would be a far better system.

I'll end with a few thoughts on the game. It has one basic problem: it's boring! I only took about 5 minutes for each turn – there just isn't enough to do. Normally when I know there's a turnsheet for a game due in my mailbag I'm dying to get home to open it up and see how I've done, but with *Shattered World* I just wasn't that interested. In a pile of post it would be put at the bottom to be opened after the interesting bits.

The standard price is £1.50 per turn – for that money I expect a far better game, and there are cheaper games around which give a much better deal.

At first I thought *Shattered World* might be a good game to introduce beginners to PBM, but after three turns I gave even that notion up. *Shattered World* just doesn't give an idea of the addictive quality of the hobby, and would probably put off any potential PBMers. The *Shattered World* idea has possibilities but they just haven't been developed into a worthwhile game.

ANON II

Setup and two turns in Shattered World **costs £5 and further turns cost £1.50 each. Contact Jade Games, *PO Box 54, Southsea, Hampshire PO4 0NA.***

WRITE A REVIEW

IF you'd like to review a PBM game for CRASH, anonymously, send your name and address on a postcard to: **Brendon Kavanagh's PBM Mailbox, Readers' Reviews, CRASH, *PO Box 10, Ludlow, Shropshire, SY8 1DB*** and we'll try to find a game for you.

You will not be charged to play it but will be expected to produce neatly-written or typed, coherent reports.

This is what reviewing involves:

1. When you first receive the startup package, jot down what you think of it.
2. When you start playing, make a note of your first thoughts of the game.
3. After five turns, send CRASH a review about as long as those this month. Summarise everything you jotted down when you started, whether or not your thoughts turned out to be true, and make any comments you'd like to on the game (diplomacy, GM quality – anything!). And include a brief explanation of what the game is about.
4. Carry on playing the game, making notes of your progress and any praise or criticisms you feel like.
5. After a further five turns write to CRASH again, saying just what you think of the game as it has developed. If you wish to stop playing you can do so now – but say why you no longer wish to play! Basically, this second review should expand on any ideas you had in your first review and comment upon the game's development.
6. Continue playing the game, letting CRASH know in a letter every now and then how you are getting on (perhaps you could send in an update on every turn?).
7. When the game ends for you, send CRASH a details report on just how you enjoyed the game, what you did, what it's about, whether you would play again, and whatever else you feel is relevant.

SPECIAL STARTUP OFFER

SOMEONE'S got a sweet tooth at **Vengeance Games – and they're offering a free startup** in any of its four games to the first five CRASH readers who send a packet of mints to the company! The startups are worth £10 and include setup and three turns.

World Of Vengeance is set in Britain after a massive disaster, where tribes of semisavages scavenge the desolate landscape trying to regain technological power supremacy over other tribes. The player leads a tribe through the very detailed game. Turns cost £2 each,

Where Lies The Power is probably suited to the more mature, creative player – you need to be a good diplomat and a convincing liar! The object is to work your way up through a feudal political system ruling a vast empire, but you can approach the task in many different ways: be a peaceful talker or a power-mad invader, it's up to you. Turns cost £1.75 each,

Orion's Finger is an SF role-playing game in which you first design your three characters from a menu system. There are seven strange worlds to adventure through, and judging by the rulebook the game seems quite imaginative – another one for the thinkers. It's £2.25 per turn.

And ***El Presidente*** is a political game for 40 players: a struggle for justice, truth and self-interest on a war-torn island. Meddlers in the politics of your nation include the CIA and the KGB . . . and turns cost £1.50 each.

Vengeance Games points out that turns in all five cost 25p extra for players in continental Europe and 50p for players in the USA and Australia. And some startups may be delayed till enough people have joined.

Send your mints or inquiries to **Vengeance Games, *57 George Street, Altofts, West Yorkshire***, enclosing a stamped self-addressed envelope.

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WAR CARS Firebird Silver

PLEASE NOTE: this offer is subject only to the discounts detailed above; other discounts such as CRASH subscribers' extra discounts and the normal CRASH Mail Order bulk-buying discounts do not apply to games sold through this offer.
The games above were reviewed in Issues 43, 44, 45, 46, 47 and 48 of CRASH, and *most* are available, but CRASH cannot guarantee that they are ready yet. If in doubt give Aggie (alias Carol Kinsey) a ring on (0584) 5620 to find out whether the delay will be longer than 28 days.

AND THEN THERE'S . . .

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CRASH ZX SPECTRUM

MAIL ORDER, PO BOX 20, LUDLOW, SHROPSHIRE SY8 1DB



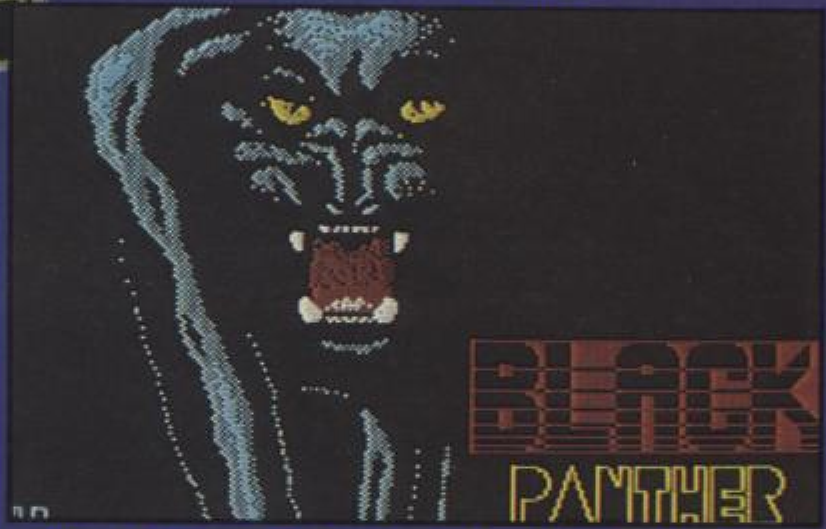


► This recreation of CRASH's Issue 20 cover from Anthony Henn of Great Burr in Birmingham makes excellent use of colour and some very good pixel work.

The savage bloodshot image on the Spectrum screen recreates the atmosphere of Oliver Frey's cover – and, of course, the Level 9 adventure Red Moon on which that was based. (The cover is now a very popular T-shirt.)

This month's top prizewinner, Anthony earns himself £40 worth of software.

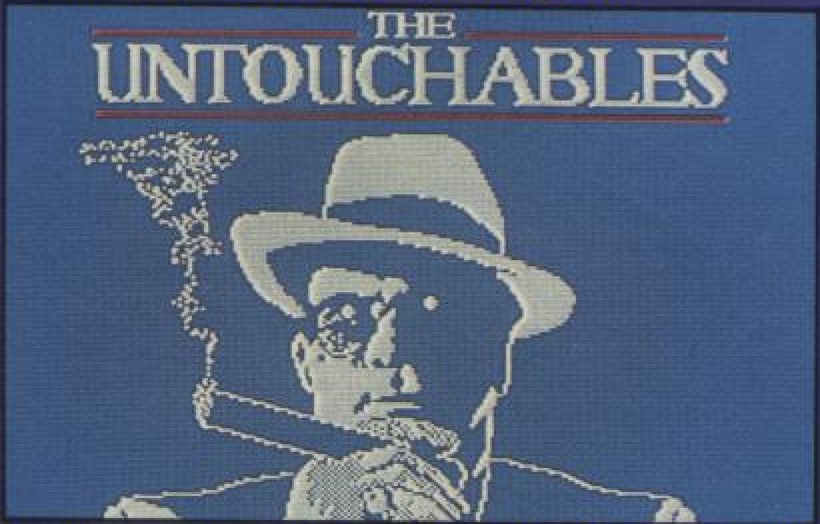
MIKE DUNN introduces your Spectrum SCREEN$ – and a new prize system



► Growl! Just to prove that being criticised doesn't break my bones, there are a couple this month by Mark Otway of Shepperton in Middlesex.

He's the creator of many excellent screens – as well as a justified complaint in last month's Forum! (I'm sure he'll be relieved to read of the new On The Screen prizes.)

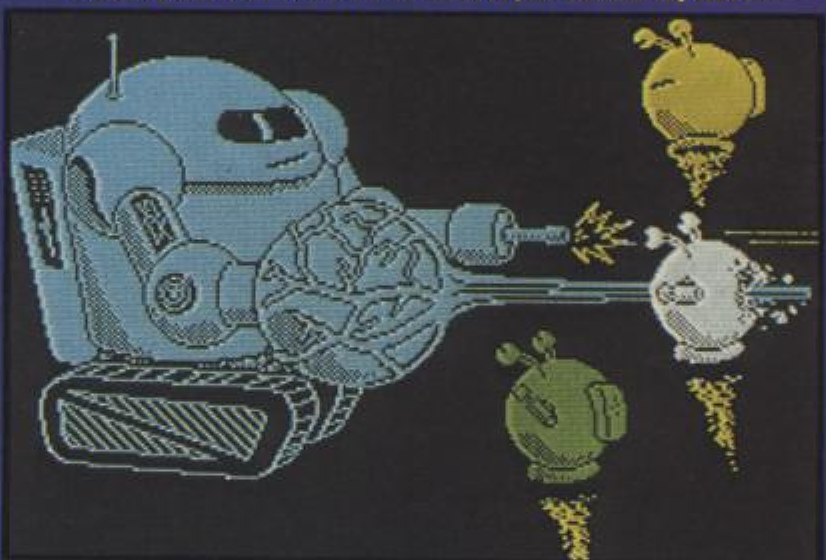
A black panther slinks out the darkness of your cathode-ray tube . . .



► Another musical masterpiece for On The Screen – this picture, from M François Briard of Numur in Belgium, is taken from the cover of the Untouchables soundtrack album. Et c'est beaucoup joli aussi, n'est-ce pas?

► It's certainly a month with a foreign flavour – after the Belgian soundtrack cover comes a cat from Scandinavia! Håken Strom of Ashammer in Sweden sent in this monochrome Garfield . . . yet another version of the much-exploited mog (and something tells me there's a catty bit on page 18).





► Battle, this month's second screen from Mark Otway, is quite different from his other – colourful, cheerful and On The Screen!

► Another bit of cartooning fun from Håken Strom of Sweden – this time it's Gaston. And what a jolly chap he is too . . .



NEW PRIZES

WE'RE changing On The Screen a bit. Because there've been so many problems with artists not receiving the screen dumps of their printed work, there'll be a software prize instead. (Of course, people whose work was printed in previous issues will still get their framed and mounted screen dumps from Rainbird.)

Every month, the top prizewinner (the person who sends in the best screen, not necessarily the most!) gets £40 of software of his choice – and everyone else who has a screen printed gets not only fame but fortune too, with £10 worth of software.

But just to make things confusing, all the On The Screen prizes will be **£50** worth of software next month – so get your SCREEN$ in very fast! (In fact, all prizes offered in this issue have been increased to £50 – it's the Golden something.)

Don't forget to include with your tape/disk a list of software that you'd like if your screen gets printed. And if you don't want me to keep your JVC-AD90FX120us chrome high-bias megatape, you must send an SAE!

Keep your ego happy and your software collection bulging: send your screen dumps to **MIKE DUNN, ON THE SCREEN, CRASH, *PO Box 10, Ludlow, Shropshire SY8 1DB*.**



THE PRICE OF MAGIC

Programmer ANTHONY BAILEY finds adventure-writing made easy in the utilities *GAC* and *PAW* – which produce those good, cheap home-grown games

On the Spectrum adventure scene, 1987 was a lean year with few major releases. Games costing more than £3 were rare, and even the ubiquitous budget range was outnumbered by a mass of mail-order home-grown software. The commercial releases were distinguishable only by their packaging and sometimes their graphics, but the quality of ideas and writing to be found in the best home-grown adventures was of a very high standard.

The reason for this preponderance of good software is that adventure utilities have at last come of age, allowing many amateurs to produce a professional-looking adventure. Of course, if you want to write something worth playing, you'll still need a flair for atmospheric prose and a good imagination!

This article compares the two major adventure-writing utilities, those awkward-sounding acronyms *GAC* and *PAW* (Incentive's *Graphic Adventure Creator* and Gilsoft's *Professional Adventure Writer*).

ARTISTIC LICENCE

If you've used any of the so-called 'arcade-game generators' you'll no doubt have noticed that all they really let you do is alter movement patterns, graphics and the map of a game rather than allow you to design anything really innovative or different. But there's much more freedom in what you can do with an adventure creator. Though Gilsoft's *The Quill* tends to produce adventures with a rather cloned appearance, *GAC* and *PAW* offer the user more opportunity to change the look and style of the game.

Most adventures can be divided into three main segments. There is a database which contains such things as all the text describing locations and objects, and the messages and vocabulary. There's a parser which allows the player to type in a command and then decodes the input. And there's an interpreter: this is the heart of the adventure, where the computer examines the player's input and works out what messages or location descriptions should be output. Essentially, the interpreter is the part which handles the exchange of information between the player and the computer.

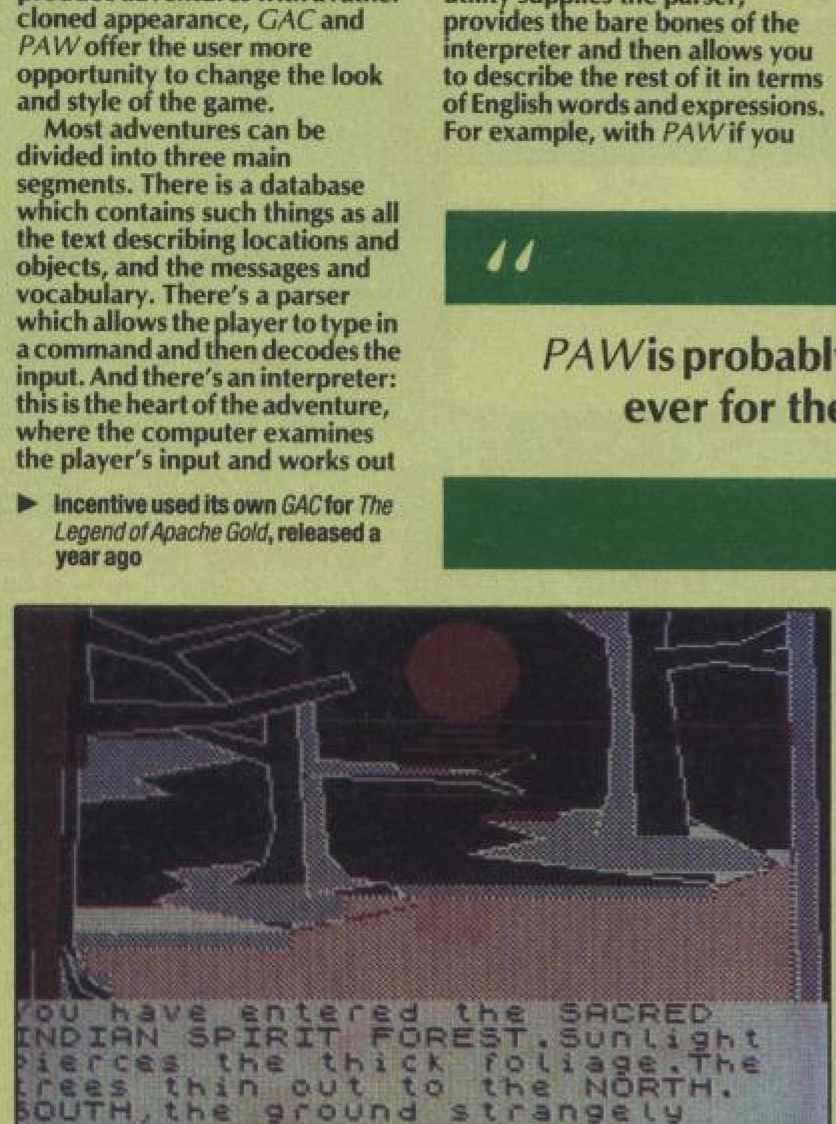
When a programmer writes an adventure from scratch, he has to write the parser and interpreter in machine code. Now with an adventure-creator there is no need to write any code – the utility supplies the parser, provides the bare bones of the interpreter and then allows you to describe the rest of it in terms of English words and expressions. For example, with *PAW* if you want something to happen only when the player is carrying a certain object you use the word CARRIED. In effect you are using a very simple and user-friendly programming language.

PAW and *GAC* are both rather good adventure creators and both deserved the Smashes they received when reviewed in CRASH (in Issues 40 and 32 respectively). And they cost the same: £22.95 on cassette, £27.95 on microdrive (there's now a +3 disk version of *PAW* as well).

But which utility is more useful?

> "*PAW* is probably the best utility ever for the Spectrum"

► **Incentive used its own *GAC* for *The Legend of Apache Gold*, released a year ago**



SLICK AND SIMILAR

The packages are similar. Their presentation tries hard to justify the apparently high price tag; a single cassette wallows in a huge plastic case. The cassette contains the main program and a 'quick start' database with some basic vocabulary command, along with short but impressive demonstration games, and in *PAW*'s case some alternative character sets.

GAC has a well-written, informative, detailed manual; the two *PAW* manuals are excellently written, with straightforward, chatty prose in the introduction and further detail and a reference section in the technical guide. So

the new user should have no problem getting to grips with the utilities straight away.

PAW allows 16K of program to be written straight off, and from then on it will overwrite parts of itself which are automatically reloaded from tape if they are required again. This technique allows another 11K of space to be used (giving a total of 27K per game). And if you have a 128K Spectrum *PAW* takes full advantage of the extra memory and lets you write a massive 117K adventure!

But *GAC* games sit complete in memory, giving you about 23K of free memory to write in. But Incentive doesn't plan to release a 128K version of *GAC* in the near future.

There's a simple menu at *GAC*'s front end; selecting an option from this takes you through a series of question-and-answer inputs. Pressing BREAK takes you back to the main menu again.

The *PAW* system of menus and submenus will be familiar to users of *The Quill*. Both systems are user-friendly, though *PAW* scores by allowing the author to view a scrolling list of all the entries made; *GAC* will only display them individually.

ADVANCED PARSERS

Both utilities have advanced parsers which allow sentences with up to two nouns, a verb, an adverb and a preposition. These sentences can be chained with conjunctions or punctuation to create really complex commands.

And both programs will recognise IT, so GET RING AND WEAR IT is catered for. *PAW* allows you to qualify a noun with an adjective, so the finished game can differentiate between OPEN RED DOOR WITH SMALL KEY and OPEN GREEN DOOR WITH LARGE KEY.

GAC splits vocabulary into three categories: verbs, nouns and adverbs/prepositions. Up to 255 words are allowed in each category, and as many as you desire can be synonyms (for example, GET and TAKE can be treated by the parser as the same word).

PAW is similar, but subdivides the vocabulary into seven categories: verbs, nouns, adjectives, adverbs, prepositions, conjunctions and pronouns. Again 255 of each type are possible. And *PAW* treats the first 20 nouns in its vocabulary as 'conversion nouns': in other words, NORTH (noun 4) is treated as a noun in the command LOOK NORTH, but is converted to a verb if entered on its own. Nouns 1-50 are not recognised by IT – so as long as the author plans the vocabulary correctly, when the player types GET SWORD AND ATTACK GOBLIN WITH IT *PAW* will spot that IT refers to the sword and not the goblin.

LOCATIONS

GAC can cope with up to 9,999 locations but *PAW* can only manage 252; still, this should be sufficient even for a 128K creation. *GAC* offers 255 messages for the author's use; *PAW* allows these messages, too, and also has another 255 system messages. Some of these are used by the interpreter and can be altered, but most are free for the use of the programmer.

User-friendly adventures require a lot of messages and the writer of a large adventure may well find himself pushed for space.

Up to 255 objects can be implemented with both utilities. Commendably, both *GAC* and *PAW* let you define the weight of each object – thus a chest of treasure can take up more space than an apple does in the player's inventory.

And to ease the creation of automatic get/drop/wear/remove commands, *PAW* asks the author which vocabulary noun and adjective correspond to each object, and also inquires whether it is wearable, a container, or both.

GRAPHICS

Your adventure can be text-only, or use graphics; *GAC* has a fixed picture size, but *PAW* is more flexible and allows pictures of any size. And in *PAW* some text ca n be kept onscreen while other text scrolls beneath it. If you feel ambitious, and you have memory to burn, you could use pictures created with art utilities in *PAW* by calling an outside routine with the EXTERN command!

Anyway, reasonably good graphics can be simply produced with both systems. They employ the 'drawstring' technique: all illustrations are stored as a list of the commands that were used to create them.

The pictures are basically formed by drawing and filling shapes. Both packages offer 'elastic' lines, and *GAC* goes one better with a facility for elastic rectangles and ellipses. But *GAC* has only two fill patterns; *PAW* offers 15 user-definable shades and the ability to create extra character sets, definable on the utility's character-generator (it's rather cumbersome and art utilities are easier to use).

Pictures can be called as subroutines (which can be scaled, in the case of *PAW*) so that repetitive illustrations take up very little of that precious memory.

TESTING

When it comes to testing out the adventure, both *GAC* and *PAW* have useful options which allow the user to examine the status of the various flags and program counters during play. This is great for debugging.

PAW allows experienced users to manually change the values of these flags in the middle of a test. *GAC* has 256 on/off switches and 128 variables that can hold values ranging from 0 to 255; *PAW* just has 256 such variables.

Naturally, all the normal facilities such as saving and loading the database and checking on the amount of memory left, are available on both programs. *PAW* also has a superb text-compressor which replaces common combinations of letters with single bytes in memory and effectively gives you 40% extra text space – great for writing 48K games.

TABLE MANNERS

The meat of the finished adventure is the set of tables of instructions and commands which deal with all the inputs and actions of the player. *GAC* offers three types of table: high-priority, low-priority and local conditions.

The high-priority table is checked first of all; in play, that's where the program checks whether the player is in darkness, for example. Low-priority conditions include such things as responses for GETting an object, and local conditions apply only to specific locations; OPENing a DOOR would be covered in the local-conditions table, for instance.

Each table consists of a sequence of lines with a format of

IF (conditions) (actions) END

so a typical line might read:

' IF (VERB (18) AND (NOUN (50) OR NOUN (51))) MESS (20) WAIT END '

which gives the conditions the look of a simple programming language.

It's a shame that syntax errors within a line are not highlighted, and that only one line can be viewed at a time – once programs get complex this makes debugging rather awkward. But *GAC* is flexible in that all numbers can be replaced with arguments such as the contents of a certain flag or a random number; this allows you to implement such things as random messages. The CONN condition (equivalent to MOVE in *PAW*) is especially useful.

PAW *TABLES*

PAW's approach has some differences. Two types of table are used, response and process, and each entry consists of a verb and a noun (which can be set to nulls) followed by a series of 'condacts' – Gilsoft's jargon for a mixture of conditions and actions.

In a response table, *PAW* looks for a match between the player's input and the verb and noun and then carries out those entries. Unlike *GAC*, *PAW* caters for entries for GETting, DROPping, WEARing and REMOVing objects as well as for GET ALL, DROP ALL, WEAR ALL and REMOVE ALL.

The condacts are rather more varied than their *GAC* counterparts, with commands such as EXTERN (which allows you to call BASIC and machine-code routines from within *PAW*), RESET (which helps in the creation of multipart games), PARSE (which decodes anything within quotes in terms of a new command), TIMEOUT (allows the computer to animate graphics or move around game characters whilst the player is thinking), PUTIN and TAKEOUT (for dealing with putting objects within one another; *PAW* calculates the true weight of a container), and a very powerful DOALL command (which allows the author to implement his own ALL and ALL EXCEPT commands). Some of these facilities can be simulated with *GAC*, but *PAW* makes everything elegantly simple.

The process tables operate in the same way, but the verb and noun are used simply as a label for the author's own reference. Process 1 is called every time a location is described, and is the equivalent of the *GAC* high-priority table. Process 2 is called after every input or timeout, and this is where events beyond the player's control take place.

The best facility of all is *PAW*'s ability to create another 253 subprocesses, which can then be called as subroutines from response or process tables. Calls can be nested up to ten levels, and the processes can even call be recursive (call themselves). Sensibly used, this facility contributes to programs which are beautifully structured and hence easy to debug and alter.

WHICH?

GAC is an excellent utility. But if you haven't got yourself an adventure creator (and if not why not? – they're tremendous fun!) the flexible and friendly *PAW* is the one to go for. It's probably the best utility ever written on a Spectrum and it should turn the adventuring world head over heels.

THE RAVEN
Eighth Day Software, £5.50

Well-known mail-order software house Eighth Day is launching a new line in adventures this month. But the new Detective Tales series from the Wirral software house is, sadly, only for 128K adventurers at the moment – and here's why.

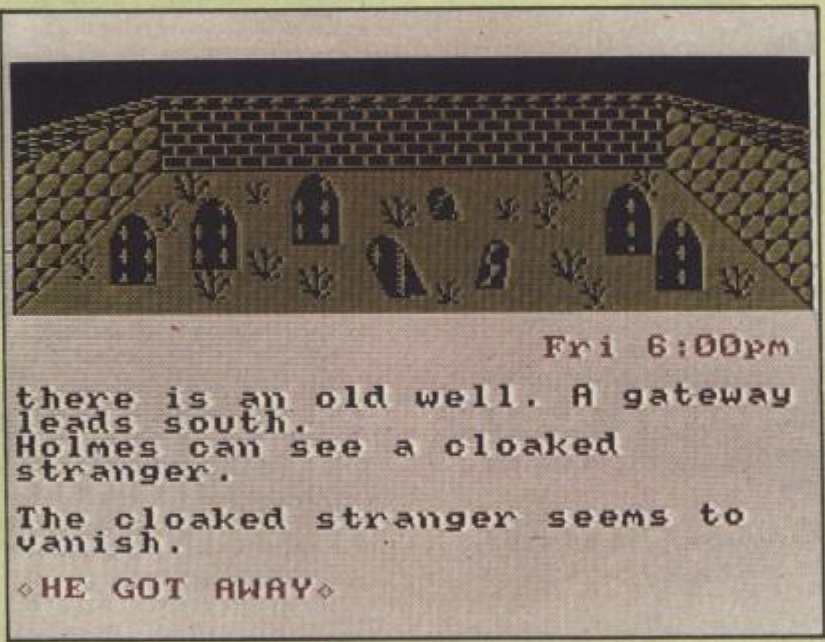
The first game in the series, *The Raven*, features the inimitable Sherlock Holmes – and as the famous Victorian detective you must solve a complicated mystery.

An invitation from that eminent though controversial physician of the criminally insane, Doctor Vybes, leads the master investigator to a small and remote English village just as darkness is about to fall.

There, in a quiet bookshop, Holmes learns more of the doctor and his work.

But soon after Holmes reaches the doctor's home, murder is committed. And the seeds of confusion are sown as Holmes searches for the real villain of the piece, avoiding obvious conclusions and attempting not to become a corpse himself.

► The strange case of the bad Vybes: *The Raven*



The Raven, written using Gilsoft's *PAW*, recognises not only the standard verb-and-noun combinations but also adverbs and prepositions. Words can often be abbreviated, and the vocabulary is fairly flexible, supporting both SEARCH and EXAMINE commands. Every character remembers what you have done – one even has a 10K memory!

Each location is graphically illustrated, and the text descriptions are atmospheric and informative.

The Raven is extremely sophisticated and brings together all the humourous and horrible elements of the 19th century. Order it from Eighth Day Software, *18 Flaxhill, Moreton, Wirral, Merseyside L46 7UH.*

OVERALL 84%

FOOTBALL FRENZY
Alternative Software £1.99

The trials and tribulations of football management could test the resolve and skills of even the most hardened First Division pro. But in *Football Frenzy* you are the manager of small Grimesditch Rangers, and getting your club to the Cup Final is just the beginning of an awesome task.

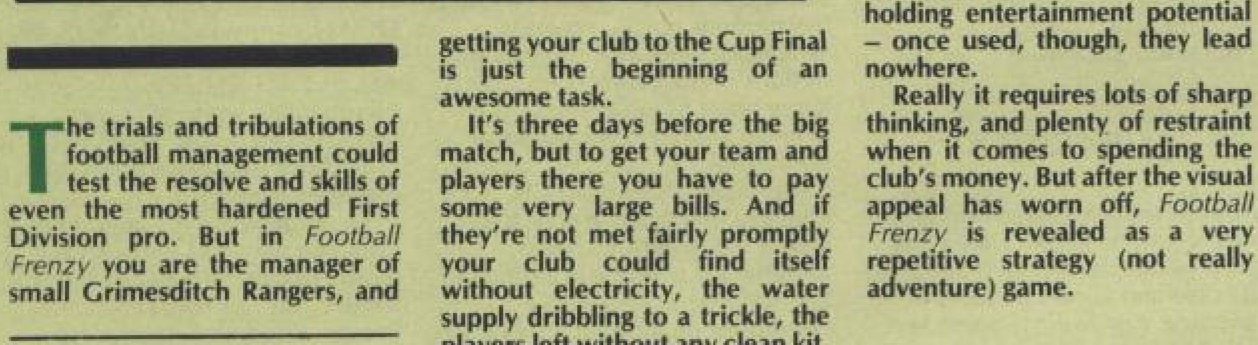
It's three days before the big match, but to get your team and players there you have to pay some very large bills. And if they're not met fairly promptly your club could find itself without electricity, the water supply dribbling to a trickle, the players left without any clean kit, and no club literature printed.

Football Frenzy has a fairly large vocabulary, including such subtle commands as GESTICULATE, KISS, GROPE, UNDRESS and LAY instructions holding entertainment potential – once used, though, they lead nowhere.

Really it requires lots of sharp thinking, and plenty of restraint when it comes to spending the club's money. But after the visual appeal has worn off, *Football Frenzy* is revealed as a very repetitive strategy (not really adventure) game.

OVERALL 39%

► Really strategy?: *Football Frenzy*



STIFFLIP LOOSENED

Stifflip & Co adventurer DAVID OWENS of Ivybridge sent in this part solution to the Issue 44 Smash. If anyone can get past the swamp we'd all be glad to hear!

Miss Primbottom . . . take match from Stifflip. North, east, tie thread to rope. Pull thread, buy jar, pick up circular. West, south, west, west, west. Climb tree, untie knotted rope to get rid of rope trap. Pick up hanging vine, jump, pick up hanging vine again. Jump, pick up crystal, climb vine. Light match and circular. Put circular in bee hive. Put honey in jar. Jump twice. Pick up reed. South, east, give reed to Stifflip. Give hairclip and crystal to Braindeath.

Viscount Stifflip . . . cut reed and give wireless to Braindeath. North, east, buy box. West, south, west, north, west, down. Blow down reed. Climb snake.

Professor Braindeath . . . open wireless, put crystal and hairclip in wireless. Close wireless. North, east. Give wireless to barman. Pick up rubber glove and calling card. West, south, west, north, west, down. Climb snake.

Colonel Bargie . . . west, west, pick up salt deposit. North, down, climb snake.

Miss Primbottom . . . west, give honey to monkey. Take banana from monkey. North, west, down. Climb snake.



S.T.I.
Bug Byte £2.99

A supercomputer gone wild is the starting point for Bug Byte's two-part *S.T.I.*. The mighty machine AROC has been attacked and damaged, and in response sets up a series of defence systems around itself.

Even an incompetent washing-machine repairman ought to be able to get through and mend the mutilated microchips – but an improbability storm has left AROC with premature senile dementia, and getting through to this computer's confused systems is going to be no easy task.

The repairman's mission begins in a plane. Items such as a locked briefcase, a golden key, walking stick and parachute can all be picked up. But what should be taken and what should be left to ensure a safe jump?

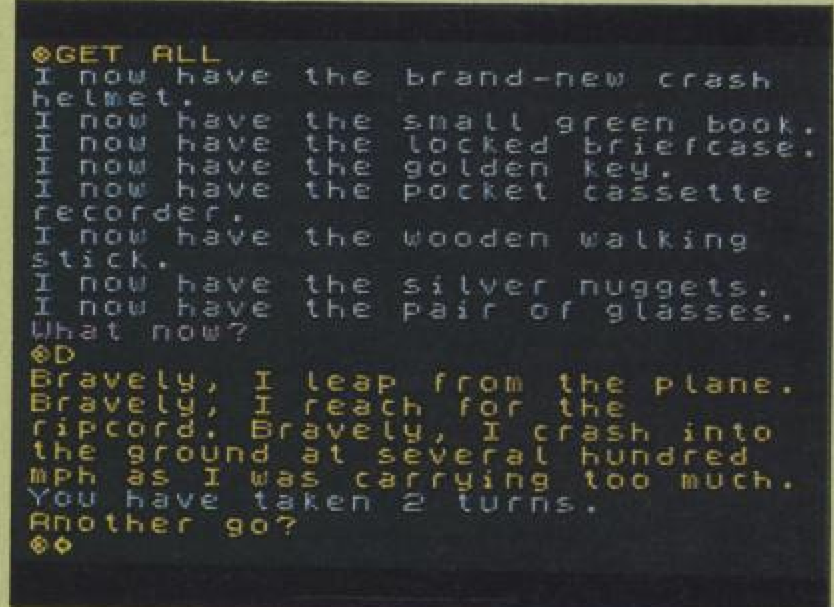
Once on terra firma, the mechanic hero must wend his way through countryside and streets, gathering the equipment he needs as he goes – and avoiding menaces such as werewolves. The final challenge is to actually repair AROC.

S.T.I. is an example of how original presentation can transform an above-average game into an excellent one. There are loads of locations to explore, and a wealth of humorous, informative text enriching them. It's a reasonably complex game, with plenty of objects to collect and puzzles to solve, but basically it's in a straightforward adventure format – though none the worse for that.

The vocabulary is good, and *S.T.I.* is very quick to respond; it has an interesting scenario and is brilliantly cynical. Bug Byte brands this 'such a vulgar, low-class adventure', but it plainly isn't!

OVERALL 80%

▶ **Between AROC and a hard place:** *S.T.I.*





GOLDEN SHIP BOARDED

We were inundated with solutions for *Sinbad And The Golden Ship*. Thanks go to MARGO PORTEUS of Derby; MARK STEVENS of Stourport-On-Severn; Liverpudlian PAUL VALENTINE; JOSEPH MCNAMARA of Cleveland; GRAHAM HAW of South Shields; JUNE ROWE of Launceston; and DENNIS FRANCOME of Dunnington, Yorkshire, whose solution is printed here.

Swim north to ship and climb aboard. Search the ship, find and take the rope. Go east to captain's cabin, get map, read map. Upstairs to wheel and steer ship east twice to island.

Dive overboard and swim east. Go south. Find and examine chest. Get axe. Hit lock with axe. Open chest and get lamp. Continue south and help old man past the quicksand. Continue to steps and dump old man by entering water. Go east and climb up to castle. Lower drawbridge by striking gong with axe. To overcome dragon, examine collar and stone. Cut chain with axe.

The castle is a maze of rooms. Find a red gem and take it to room with iron cage. Strike skeleton with axe to overcome it. The wizard appears. Enter and examine cage. Get loose bar and throw at the wizard. Pick up all your treasures. Take the orb, descend stairs and enter the caves. You should have so far collected a rope, a lamp, a gem, and orb and an axe.

Read spell on wall (this releases the genie of the lamp). Kill the genie by striking the lamp with the axe. Get the key which is in the lamp. Exit caves to the valley.

Examine snake. Examine tongue and tie rope to it. Pull rope and get gem. At Lodestone Mountain drop all metal objects, or the roc will have you.

Enter cave. Continue to lake. Dive down and swim east. Swim up. Find horse. Lasso, ride and examine horse. Take the gem and swim ashore. Find locked door. Unlock it with the key. Enter caves.

Find idol. Examine idol. Examine hand. Put gems in rings. Get gems. Get flask. Carry all gems in the flask if required.

At ravine, climb down rope. Then climb up rope to beam. Go east. Go down steps. Climb stairs after meeting ogre. Go west onto beam and down rope. East onto ledge. Examine wall and wipe slime. Open door. Go east and continue to shore and then to lake.

Swim east to Golden Ship. Climb aboard. Put gems into flask. Give flask to Djin. When Djin enters flask, trap him and the game is completed.

ZIP CORRECTION

In Issue 48's zip routine line 60 should have read:

60 DATA 33,0,0,237,66,229, 197,63,10,0

Stuck? Triumphant? Send your tips and queries on adventures new and old to SIGNSTUMPS, CRASH, *PO BOX 10, LUDLOW, SHROPSHIRE SY8 1DB.*

The most interesting are published but personal replies are not possible.

This month's adventure reviews were written by DOMINIC HANDY, GORDON HOUGHTON and IAN PHILLIPSON

FRNTLINE

with Philippa Irving



THE ROLE OF RULES

THE STRATEGY and wargame genre is the only one still offering a realistic market for the back-bedroom producer. This month which has been dominated by home-grown releases, and next month I'll be reviewing another game from a very small concern. The situation comes about largely because the flashy packaging and elegant programming characteristic of 'big business' releases cannot, in this type of game, be self-justifying.

Yes, beautiful graphics are aesthetically pleasing, and in a computer game – whether arcade or arcade adventure – which seeks to create its own world, they can make an important contribution to the gameplay. But in a strategy game, the elements of play are more easily and more starkly exposed.

That's why a simple, straightforward strategy game like this issue's *Boxing Manager*, which uses nothing but sequential text messages and very BASIC animation, can be extremely addictive.

Computer arcade games are like no other game ever invented. But strategy and wargames are directly related to games that can be played by hand, in this fundamental way: they have to be genuinely well-designed to be any fun at all, and physical components do not necessarily affect one's enjoyment. And of course computer wargames are directly derivative of board wargames.

This brings up the interesting similarity between the types of game which come under the auspices of Frontline, because on the surface a 'pure' strategy game and a simulation would seem to be different.

I've never really been into the real wargaming scene, mostly because I can't afford to buy regiments in miniature metal and I certainly can't afford the time to paint them. But it seems to me – from the outside – that the reconstruction of a historical battle is a genuine objective.

Board wargames shade slightly off to the less starkly realistic, probably because they tend to recreate large-scale campaigns like the entire Second World War or the Normandy landings, and therefore have to have more abstract rules.

But an abundance of rules is a characteristic of simulation games. The more the better; as many modifiers as one can imagine, so that one can describe exactly how far a treadless tank could move in heavy rain through four feet of mud while shooting at a foot regiment. The objective is to pin all reality down with numbers, and it doesn't matter at all how many hours it takes to work out each turn so long as everything is being done thoroughly.

The fun of such a game can often lie not in winning or losing – for if one takes the side which lost in a hopeless battle then, unless there's some obvious alternative strategy which eluded the generals of the day, history is honoured.

At the opposite extreme are games played with an ordinary pack of cards which epitomise the utilitarian medium. After all, there is nothing inherently interesting in a pack of playing cards, and though they may be beautifully painted most aren't. The impact of a card's design has been dulled by long familiarity, and it certainly makes no difference to the enjoyment of card games.

I happen to think that most card games are dull anyway, but bridge certainly is not. Bridge is one of the most addictive games known to man – particularly when it's rubber rather than duplicate bridge. Its rules are simple, and it only has two 'screens' (bidding and play), but the strategic and social variations possible within its framework make it very difficult to give bridge up to eat and sleep. And for another type of mind, the same can be said about chess.

Successful computer strategy games reproduce this combination of easy, structured rules and rich strategic variation. Curiously enough, traditional games are usually extremely boring when translated literally to the computer; without human interaction, they seem pale. What works instead is 'computer interaction' – but the framework remains the same.

Computer wargames may have complex simulation-type rules, but because modifiers and calculations to put them into effect are done invisibly by the computer the emphasis has to be on a simple rule framework. A computer wargame which allowed the player no chance of winning at all (perhaps a successful spoof compilation could be *Six Hopeless Historical Battles*?) would satisfy no-one.

BOXING MANAGER

Producer: **Willysoft UK, *36 Walton Avenue, Windmill Lane, Sneinton, Nottingham NG3 2BS***

Author: **Ian Williams**

Price: **£2.95 (mail order from producer)**

Boxing is being knocked into disrepute, even in the establishment which has traditionally supported it: only a few months ago, it was formally ousted from the timetable of one distinguished public school. And medical experts are forever producing reports which describe the effects of being repeatedly hit on the head.

Though this game is exactly what its name implies – a straightforward management game in the classic pattern of *Football Manager* – author Ian Williams espouses antiboxing views. He decided to write it after seeing Barry McGuigan knocked senseless defending his title at Caesar's Palace, to make the point that boxing is a barbaric 'sport' that 'leaves grown men with the vocabulary of a four-year-old'.

But what Williams has produced – as he himself ruefully admits – is a fiercely addictive game which entirely fails to put its moral across. And whatever one's view on boxing, this is probably just as well; a game which is balanced on a soap box is rarely much fun to play.

Boxing Manager puts the player in charge of a single boxer (whom you can name). He has five characteristics: strength, stamina, skill, image and IQ.

Strength determines how much damage he does to an opponent when he hits him. **Stamina** corresponds roughly to 'hit points' and is temporarily drained in a fight; therefore it affects how long he can keep going. A high **skill** rating increases the probability of your boxer hitting his opponent in the first place.

Image is an abstract indication of how well-known and respected your boxer is – and it is the statistic that, ultimately, you are aiming to increase. **IQ** goes down every time the boxer is hit on the head, though its decrease seems arbitrary.

The player, as manager, has a bank balance which – as always in games of the type – dominates the gameplay. Several things cost money: unless you own your own gymnasium you have to rent one, a trainer demands a fixed fee per fight, and if the boxer has been injured the player is expected to shell out for private medical treatment. The only way to increase money is to win fights, and as the boxer's image rises he is offered more lucrative engagements.

The game is played in series of rounds, each starting with a menu which gives the player the opportunity to sack his current

trainer and hire another one. The trainers' abilities are well-known in advance – trainer 1 can increase the boxer's scores by 1 point and trainer 6 by 6 – though their fees per fight vary alarmingly.

The player can hire and fire trainers without compunction, for it seems to raise no bad feeling. If having graduated to an expensive trainer and then lost a lot of money the player would like to return to a cheaper one, the less able trainer displays no unworthy sense of pride and is happy to be re-employed. The player can also buy a gymnasium as a long-term investment from the round-opening menu; it's fantastically expensive, but it generates income by opening to the public, and at least with a gymnasium you don't have to pay regular fees to use somebody else's.

The round continues as two opponents are offered for the player's boxer. They are each given a name and a number, which seems to correspond roughly to a rating. The player can't see an opponent's statistics till he's chosen him, but the boxer with the higher rating is always more formidable – sometimes considerably so – than the other. Fighting him means more prize money and greater prestige.

Before the fight, the trainer gets the chance to improve the boxer's ratings. The trainer has a fixed number of points to distribute, according to his fee; the player chooses exactly where to spend these. You can improve any one of the boxer's statistics except IQ and Image.

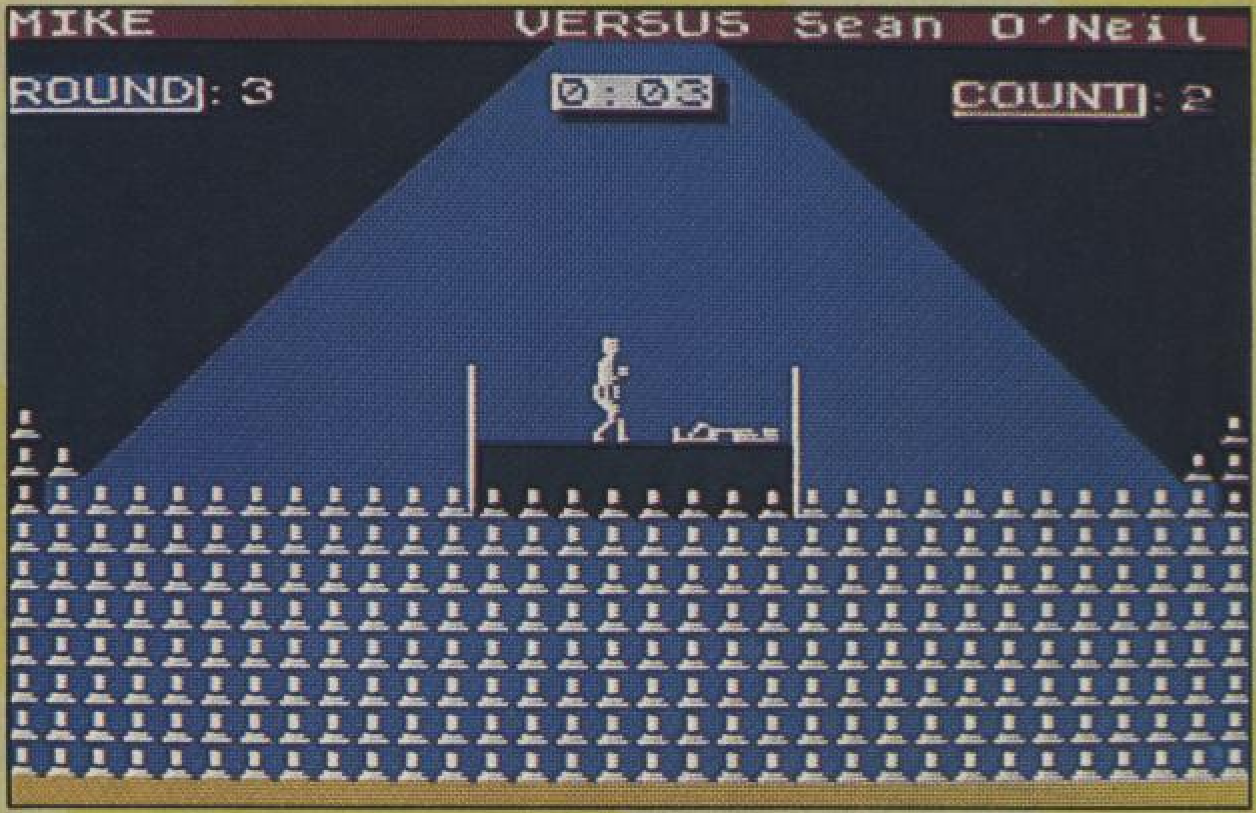
So the points will really start to pile up after you've made a lot of money and can afford to hire a trainer with plenty to give away. Now I would have thought that if one were to train for any physical activity the most dramatic increase in strength, stamina and skill would come at the beginning: then a plateau would be reached and improvement would come more slowly (lots of role-playing systems simulate this tapering-off in their character advancement schemes).

But in *Boxing Manager* whatever happens to your boxer, unless you go bankrupt by losing a large number of successive fights, you're bound to end up with a pretty good fighting force eventually.

The quality of opponents increases as the game advances, in rough parallel with the boxer's own progress, and the length of each fight goes from three rounds to what seemed to me an indefinite number. The player is told before the fight gets under way whether there is going to be any bonus publicity: a fight can be covered in the local paper, broadcast on local radio, or featured in the national press, and the dizzy height of popular achievement is to be broadcast on national TV.

If you win after such a media circus, your Image increase is much higher. But if you lose, your humiliation and Image decrease are proportionally greater.

The fight is dramatised onscreen, where the graphics are – well – minimalist. Two tiny stick insects stand on a boxing 'ring' (it looks more like a platform), dancing and stabbing at each



► **In the ring with BASIC: as manager you just sit back and tear your hair**

other. But the blows, when they land, really are registered by the program. Though the very brief instructions don't mention the factor, it seems to me that blows to specific parts of the body have definite values.

If an injury like a broken nose occurs during the round the player is notified, but the afflicted boxer soldiers on. A round lasts its time limit, and at its conclusion the player is put back to the boxer's statistic screen for the few seconds allowed for rest. During that time, the boxer's stamina, drained during the bout, climbs back; but it almost never returns to full capacity, instead decreasing every time.

Quite often, one boxer is knocked to the ground. Sometimes he manages to clamber up before the countdown from ten reaches zero, but if he doesn't victory automatically goes to his opponent. The victorious boxer does a dance while the program plays the sort of silly and gratuitous tune traditionally associated with games like these.

The fight, far from being a horrific condemnation of a senselessly violent sport, is great fun to watch. Despite its primitive BASIC animation it's involving, and has the element of spectator drama that can only really be generated by exactly this (rare) type of game.

You've already made all the decisions – nothing you can now do will affect the outcome. You can only watch, and quietly scream encouragement at your stick insect.

Once you've built up your boxer's reputation and he's getting into contests lasting as long as eight rounds, the fight can be slightly too drawn-out. But this is not a major criticism: the main trouble is that it's almost impossible to drag yourself away from the game.

► **Morals are on the menu in *Boxing Manager***



If the boxer wins, he is awarded prize money and his prestige grows. The turn ends with a breakdown of the past month's accounts, and unless you're really unlucky it's easy to make a steady profit on the easiest level. If the boxer loses, his Image goes down and he has no prize money to plug the hole in his account left by the trainer's fees and other expenses.

It's not too difficult to see why the moral behind the game has no impact: the decrease of the boxer's IQ is supposed to affect his decision-making in the ring but has no perceptible effect on the play at all – except, I assume, that if it reaches zero then the game is terminated.

So the IQ factor merely imposes a 'time limit' against which to pit oneself, increasing the soundness of the game design.

Boxing Manager is written in BASIC; it's very much a home-grown product, in crudely-photocopied packaging with the minimum of documentation. But it's a wonderfully compelling strategy game with an addictive pull to make up for the lack of depth and complexity. There's certainly as much to it as to *Just Imagine* and *Football Manager*, similar games, and at this low price it's thoroughly recommended.

Presentation 74%
The game runs smoothly, and the amateurish language and poor packaging don't affect it

Graphics 60%
Mostly text, tidily presented; the boxing scenes are adequate

Rules 46%
There aren't any really . . .

Playability 90%
Don't start *Boxing Manager* if you've an important appointment, meal or sleep pending!

OVERALL 86%
Boxing Manager is enjoyable and good value, though it fails to make its moral point

FANZINE FILE



DOMINIC HANDY finds the dot-matrix printer is mightier than the sword – at least in the hands of hundreds of fanzine editors

THERE'S never been a better time for starting your own fanzine – cheap desktop-publishing packages are available for practically any computer you can think of (bar the Spectrum, which is strangely still lacking one). So it's not surprising that the fanzine file has had to be replaced by a fanzine drawer to cope with the deluge of old and new zines that's arriving at CRASH.

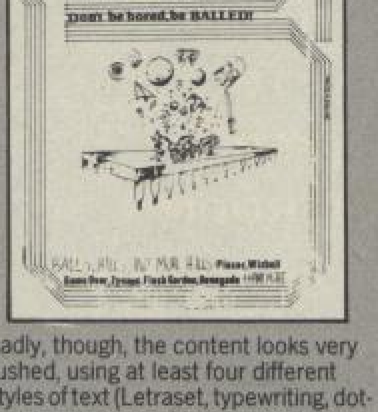
And it seems Gremlin Graphics has the same problem. With over 100 fanzines on file, Gremlin has had to ask zine editors to send a Jiffy-type bag if they want to get to grips with review copies of Gremlin games!

Most editors this month are aware that the end-of-year exams are looming, and many fanzines are already giving apologies just in case the next issue is a few months late. Indeed, Cheltenham-based *Microchip* has suspended publication till exams are finished. It plans a July relaunch.

ZAPPED

First out of the drawer this month is **Zapper**. Little thought is evident in its layout and presentation, and the reviews, one page per game, are very shallow and not very informative. You have to start with something good if readers are to want more.

The first issue of ***8-Bit***, however, contains everything the pure arcade-games player would want in a fanzine: reviews of the latest games, POKEs and tips, charts and even a competition.



Sadly, though, the content looks very rushed, using at least four different styles of text (Letraset, typewriting, dot-matrix printing and handwriting), and the layout is repetitive and bland. The screenshots range from very clearly-defined stills to shots that look more like smudges than pictures.

The ratings in *8-Bit* are printed much too large (wasting almost a quarter of an A4 page), and the handwritten comments beside them are unhelpful. Some good ideas have gone into *8-Bit*, but the details need more attention. Perhaps coeditors Glen Stanbridge and Charles Heath will have settled on a style when the second issue hits the streets.

Lack of consistency is not a fault of Maidstone-based ***Restart***. Almost every half-page review includes a clear screenshot and informative critical text, followed by ratings – very simple, but very effective. Like most popular magazines (and now many fanzines) *Restart*, written by two 15-year-olds, has a wide range of appealing sections: video, book and music reviews, arcade news and charts, playing tips, short stories, previews and news.



And one eye-catching idea in *Restart* is rereviewing a prequel alongside a sequel (*Bombjack* and *Bombjack II* in the issue I saw).

GREAT COMPUTER GRAPHICS

Somebody must have been playing about with the printer at the home of Dave Kelsall in Gartsang. Issues 1 and 2 of *Microphobia* are extremely well-printed, using excellent computer-generated illustrations. However, the third issue requires much more effort to decipher – and still has no screenshots!

But whoever got playing on *AMX Stop Press* (previously *Pagemaker*) certainly knows what they're doing: the illustrations are great.



Microphobia includes a strange mix of noncomputer sections: a heavy-metal page, a horoscope column and humorous short stories as well as the PBM coverage more closely related to computer games. And this school-funded fanzine doesn't try to have a comprehensive reviews section – there is only a handful of reviews in each issue, not very many for a fanzine covering five formats. But what little is said is accurate and readable.

8-Bit: *Stonebridge, Upperthorpe, Westwoodside, Doncaster DN9 2AQ.* 60p per issue, payable to Glen Stanbridge.

The Bug: Bug Subs, *28 Leaside Avenue, Muswell Hill, London N10 3BU.* 45p cover price, subscriptions 50p per issue for five or more issues.

Eprom: *328 The Maltings, Penwortham, Preston, Lancashire PR1 9FD.* 80p and a stamp per issue, payable to T Worrall.

Microphobia: *Woodtop, Goosmargh, Preston, Lancashire PR3 2ER.* 35p and an SAE per issue, payable to Dave Kelsall.

Orcsbane: *84 Kendal Road, Sheffield S6 4QH.* £1 per issue, payable to Nick Walkland.

Restart: *1 The Beams, Ufton Close, Maidstone, Kent ME15 8EH.* 40p and a stamp per issue, payable to Scott Thompson.

Specscene: *85 Kipling Way, Stowmarket, Suffolk IP14 1TS.* 20p and an SAE per issue, payable to Andrew Steel.

Zapper: *26 London Road, Hertford Heath, Hertfordshire SG13 7PN.* 35p per issue, payable to Chris Legget.

OLDER FANZINES

Many fanzines have been around for ages (apart from *The Bug*, I mean!). **Specscene**, published in Suffolk, is still going strong on its tenth issue. This latest number contains Multifaced screen dumps and is much more lively than previous issues – and at over 30 pages, with hardly any ads, it represents super value for money.

The ALL NEW white ***Bug*** has reached us. Last year's *PCW* Show provided rich pickings for the infamous team, and this issue is packed full of interviews with all the stars (even the famous Darling brothers of Code Masters!). The editors even have time to discuss not the north/south divide but the M25 divide. Some things never change . . .

Finally, two updates on the 'independent' fanzines **Eprom** and **Orcsbane**. They're almost indistinguishable, making constant glowing references to each other (and many nasty references to *The Bug*) and they're both packed full of text – with *Eprom* finding space for just a few VERY well-produced pictures.

Issue 3 of *Eprom* contains a feature on the Spectrum 128K, a special *PCW* Show report (at last!), and a rundown of the zine scene. This is still one of the best publications around – but it's now 80p (the editor says the price could rise further) and getting less frequent.

Orcsbane specialises in adventures. It's packed full of vital adventure news and reviews and has a large fantasy section – so £1 isn't really much to pay for such a large (almost 100 pages) and specialist zine.

COMPUTE CORRECTION

Compute was reviewed in CRASH Issue 46 without an address. It is: *22 Church Vale, London N2 9PA.*

ROBIN CANDY'S SCORES

YOU *DON'T* GOTTA BE IN IT TO WIN IT!

DEAD again? Lost that last life on the first level? Do YOU have trouble saving Earth from aliens? Well, don't despair – even losers can be winners with **SCORES**, because you don't have to be a high-score hero to get in (though it helps).

SCORES is a monthly game-by-game list showing the whole range of scores on the very LATEST games (*Jet Set Willy* record-breakers are out from the word go!).

Each month there'll be the top score so far received for each game – the first listed under the game heading – and then a couple of others, so you can measure yourself against not only interface-burners but ordinary mortals too.

And each month there'll be five winners picked at random from all the entries received, regardless of whether they're printed or not.

The first entry on one of this month's forms which is drawn from the **SCORES** postbag will **win** £50 of software of the winner's choice (increased from £40 for the Golden Issue) plus a CRASH cap and T-shirt, and **four runners-up** will receive CRASH caps and T-shirts too. So don't forget to tell us on the form what software and T-shirt you'd like if you do win – because every loser can win with **SCORES**.

ARKANOID — Imagine

Steven Thomas, Swansea	86350
Cyril Pean, Clapham	321710
Kevin Knox, Kilkenny	284620

ATHENA — Ocean

Paul Calvert, Peterlee, Durham	223800
Niall Lecoustre, Preston	99820
Paul Thomas, Gwent	52031

ATV SIMULATOR — Code Masters

Vincent Vity, Morecambe	12640
Miguel Nunes, Torquay	45900
David Rutherford, Redcar	24530

BATTY — Elite

Simon Auger, Canvey Island, Essex	1654075
B Mickelthwaite, Newport	38670
William Craigens , Middlesbrough	1000001

BUBBLE BOBBLE — Firebird

Tony Marriot, Grimsby	2473390
Michael Mcmurray, Glasgow	336500
Dario lopez, London W12	576880

COBRA — Ocean

Nicholas Tellis, Harrow	125450
John Newport, Northumberland	251100
Michael Young, Co Dublin	119550

COMBAT SCHOOL — Ocean

Martin Stonebridge, Ipswich	49870
David Wallis, Nottingham	50390
R Babb, High Wycombe	48380

ENDURO RACER — Activision

Paul Morris, Southport	117300
John Kish, Billingham	5042533
Christopher Jones, Coventry	1507125

EXOLON — Hewson

Michael Turner, Stoke Gabriel, Devon	558100
Royston Reeves, Hastings	50100
Steven Dubrey, Rainhill	85750

GAUNTLET — US Gold

Miguel Nunes, Torquay	12497494
Jonathan Ridehalgh, Markfield	296300
Graham Hopkins, Bushey	112650

RENEGADE — Imagine

Nicholas Tellis, Harrow	65400
Niall Lecoustre, Preston	1111187
Stephen Sistern, Peterborough	199050

STAR WARS — Domark

Paul Nardone, Stonehouse, Lanarkshire	562990
James Sammon, Bradford	4239810
Anthony Underwood, Norwich	1092500

THUNDERCATS — Elite

Martin Stonebridge, Ipswich	39210
James Belbin, Chesham	89600
Steven Dubrey, Rainhill	201950

ZYNAPS — Hewson

Justin Asher, Gedling	114375
Stephen Sistern, Peterborough	43400

WINNERS

Daniel Mattson of Bornholm in Denmark wins £40 worth of software (including *Bubble Bobble, Athena, 720°* and *Superspring*) plus, of course, a CRASH cap and T-shirt.

Runners-up, each getting a CRASH cap and T-shirt, are **J Fisher** of Gedling in Nottinghamshire, **Oswald** of Stamford in Lincolnshire, **Darren Horton** of Brentwood in Essex (where Amstrad, the Spectrum-manufacturer, is based) and **Scott Bruce** of Cheltenham in Gloucestershire (site of the government's secret-communications headquarters, where CRASH is read avidly).

Remember – *any* score sent in to **SCORES** can win you a prize.

SEND ME YOUR SCORES

Send this form (or a copy) with your scores for up to three games to **ROBIN CANDY'S SCORES, CRASH, *PO Box 10, Ludlow, Shropshire SY8 1DB***. Only genuine scores will be accepted; any improbably huge scores (68715290 in *Exolon*, ha!) will be immediately binned and the sender will be forced to listen to The Art Of Noise – a fate worse than sharing a desk with Lloyd Mangram.

NAME ....

ADDRESS ....

....

.... **POSTCODE** ....

MY SCORES ARE:

GAME	**SCORE**	**DATE ACHIEVED**
1		
2		
3		

IF A WIN TOP PRIZE I WOULD LIKE THIS £40 WORTH OF SOFTWARE:

....

AND IF I WIN ANY PRIZE I WOULD LIKE THIS CRASH T-SHIRT, CHOSEN FROM THOSE ADVERTISED ON PAGES 166-167: ....

....

Form from Golden Issue – £50 top prize

The decision of CRASH's appointed judges is absolutely final in all respects. So as for picking an argument with them – don't get in it, you'll never win it.

THE HUNT FOR RED OCTOBER

Producer: **Grand Slam Entertainments**
Retail price: **£14.95**
Authors: **Oxford Digital Enterprises**

The ultimate submarine, powerful and virtually undetectable, takes the starring role in *The Hunt For Red October.* And the strategy/ simulation game follows closely the situation set up in Tom Clancy's best-selling novel of the same name (published in paperback by Fontana).

The player is a Soviet submarine commander – but not for long, if his plans work out. For the challenge in *The Hunt For Red October* is to defect to the West and deliver the nuclear-powered craft into American hands, acting with stealth beneath thousands of miles of sea, without the conscripted crew knowing, against the might of the Soviet Red Banner Fleet.

As soon as the intentions of the *Red October*'s commander and officers became known, the captains of the Soviet Red Banner Fleet commenced an immense search-and-destroy mission for their erstwhile vessel.

Sea and air forces have combined to search the oceans and blockade American ports to prevent the entry of the *Red October*, and Soviet spy 'trawlers' monitor the world. Pressure makes the defectors ruthless and desperate in their quest, risking both their vessel and lives.

The first stages of the mission require the *Red October* to be navigated carefully through a heavily-monitored and patrolled sea passage off Iceland. The underwater landscape is dangerous and complex; careful navigation is essential, or the vessel will be grounded or damaged.

But while the Soviet fleet is on a sub hunt, the US Navy is looking to rendezvous with the *Red October*, take off her crew, and scuttle a decoy submarine. The plan is to then take the defected sub into an American port for examination – all in deadly secrecy. If the Soviet vessels are led to fire upon the Western forces, the Americans will have to abandon their scheme and, to avoid war, join the Soviets in their hunt.

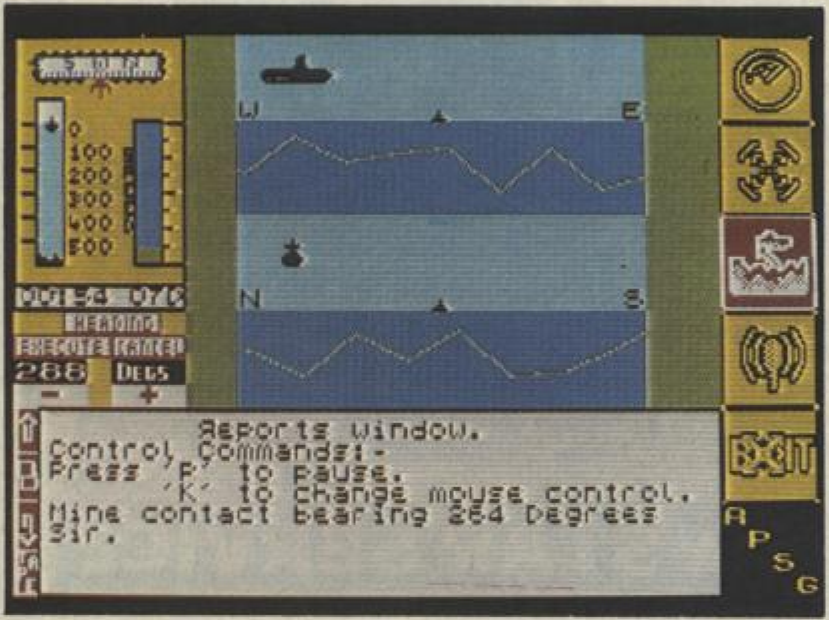
The positions of the *Red October* and the US and Soviet fleets are shown on a large map of the Atlantic Ocean. To the right of this central display is a column of command icons controlling the sonar, engineering, weapons and periscope systems of the defecting submarine. And a display panel to the left supplements these with information on the *Red October*'s speed, heading and depth, and sonar and contour map displays.

The *Red October*'s two sensitive sonar installations listen to the underwater world – sonar is like radar, but uses sound waves rather than radio waves to locate objects. The presence of submarines and ships, their headings and their identity can be established using passive sonar, but the intelligence may need to be verified by visual sightings, or by active sonar.

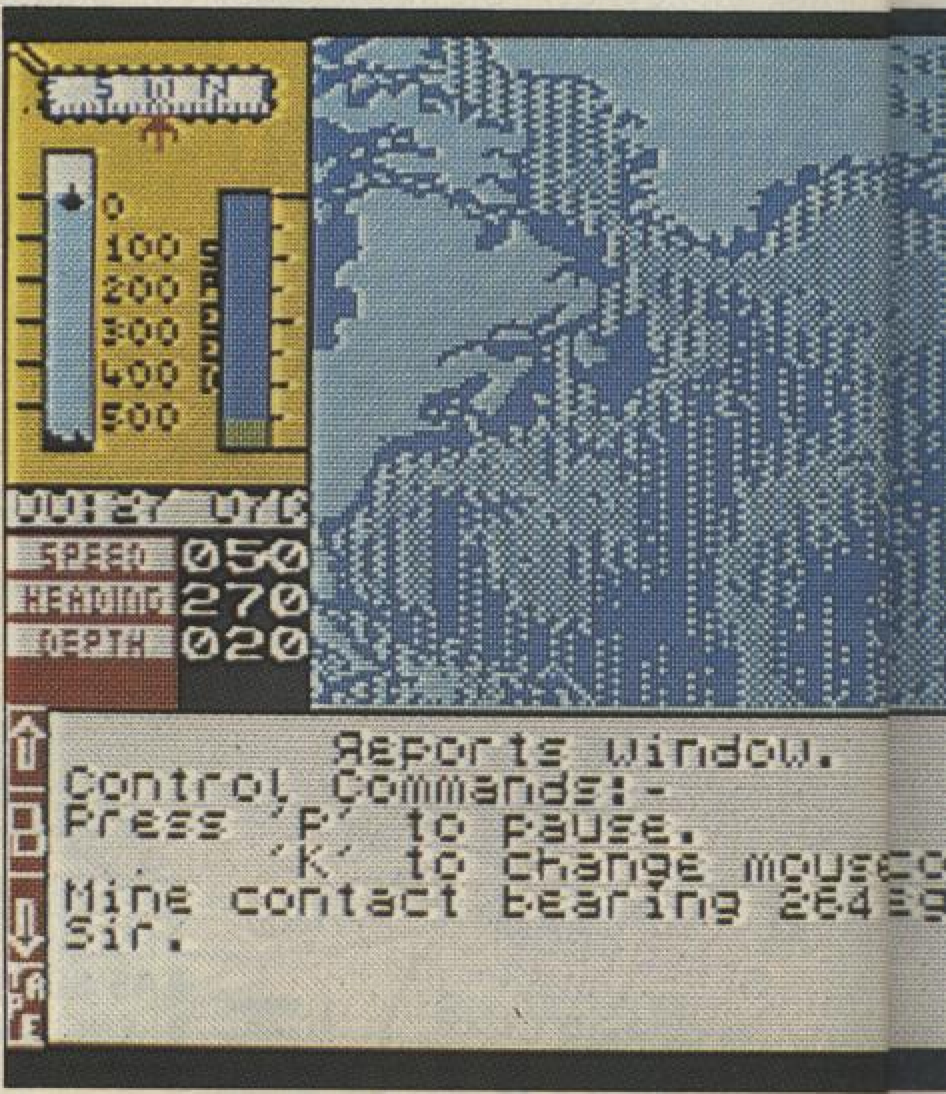
Active sonar gives a more reliable reading, but can easily give away the position of the *Red October.*

These sonar traces can be superimposed upon a contour map of the ocean bed, giving a clear picture of the safest route around underwater hazards and the opposition. Details about sonar contacts and their direction, distance away and speed are shown in the message window. This information can be fed into the weapon systems for possible attack, or into the hydrophonics circuits for an accurate assessment of the threat.

By accessing the engineering systems, the commander can switch between different forms of propulsion – nuclear and diesel



► Just when you thought it was safe to go back in the water . . .



MARK

" If Tom Clancy's novel is as absorbing as the game, I'm off to the library. The Hunt For Red October **is very playable, and I found great enjoyment in outwitting the Soviet ships and occasionally blasting a few out of the water. Control of the submarine is easy to master, and the simple icon system soon becomes second nature.**

One clever and effective feature is the newspaper report that appears in the fictitious New York Telegraph **at the end of a game, reporting whether the player's mission ends in disaster or success.**

This submarine should appeal to anyone interested in the genre. "

85%

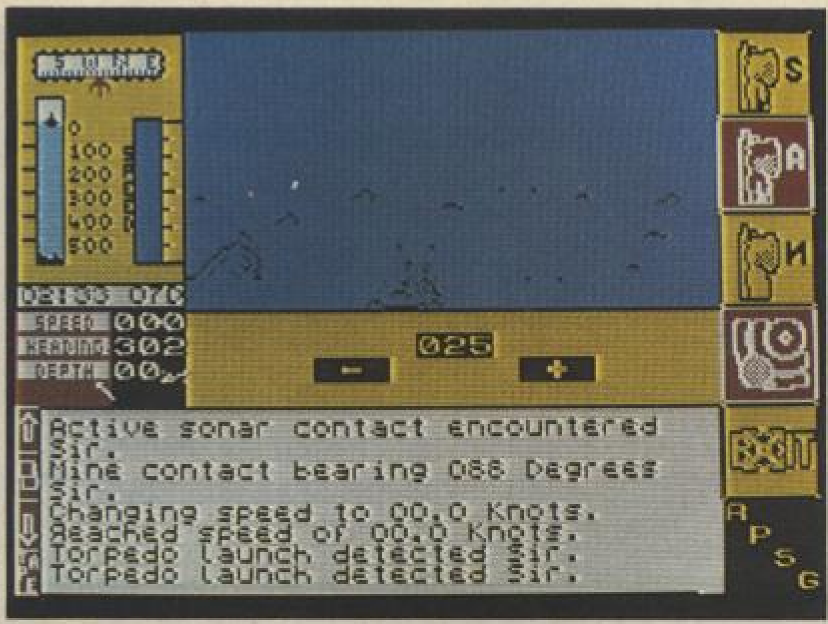
ROBIN

" The book of the game was a tense, exciting novel so it's interesting to see how Oxford Digital Enterprises approached the computer version. The result is a mixture of strategy and arcade elements.

The strategy side works well and the icon system is easy to use (though the pointer is sometimes a bit fiddly to position accurately). The problem with The Hunt For Red October **is that it's a REALLY tough game. From the very beginning, everything happens at once with mines, torpedoes and enemy vessels homing in on the submarine. This may be realistic but it's awfully unfair on the player.**

But if you like strategy and can put up with the difficulty of it all, The Hunt For Red October **is worth a look. "**

59%



▶ **Sonar and hydrophonics are the sub's electronic scouts**



power, and caterpillar and propeller drives. Nuclear power is faster than diesel and less noisy, but after ten days the defectors have to disengage the nuclear power plant and rely on diesel.

And whether the commander prefers speed (propeller) or silence (caterpillar) determines which of the two drives he uses.

The only weapons that the *Red October* carries are acoustic torpedoes. Their targets can be selected manually or through the sonar system; the number and status of each of the sub's four torpedo tubes can be called up, and if the commander chooses to manually control the torpedoes he can direct the heading and elevation.

Helpful in a tight corner, the weapons system can also release deflecting flak to decoy approaching missiles and torpedoes.

The periscope system can only be activated when the sub is near the surface; the horizon can then be checked and possible targets visually identified. And if the *Red October* must surface to carry out repairs, which are done automatically, the periscope can be used to check that the surface is clear.

The *Red October*'s arsenal of electronics also includes surveillance manual antennae can be activated, which allow the sub to pick up electronic messages sent between ships.

Whatever system is being used, all commands are given using an icon-selecting arrow. A scrolling message window beneath the main screen reveals the responses and valuable information from various system officers.

Commands must be given quickly, for Soviet forces are homing in on the *Red October* and could deal it a death blow before it has even begun its transatlantic adventure. The hunt is well and truly on.

Grand Slam Entertainments is the new name for Argus Press Software, which changed hands last November.

PAUL

" As a simulation buff I was happy to try some variation from zooming about the skies in a jet. And Oxford Digital Enterprises has managed to cram an incredible amount of detail and loads of displays and controls to fiddle with into The Hunt For Red October **– there's certainly more than in most battle-action sims. Some of the displays, particularly the sonar maps, are very realistically designed and well-programmed.**

The action is fraught from the start – you're under attack almost immediately – and the tension just doesn't die down. The icon system makes for quick and easy command-selection, which is just how it should be with so many activities to take care of in real time.

The only letdown is the strange loading system, which seems to require the game's start position to be saved on a separate tape so a new game can begin after the submarine has been sunk. But this doesn't detract much from an otherwise excellent and atmospheric simulation. "

83%

COMMENTS

Joysticks: Cursor
Graphics: atmospheric
Sound: meagre
General rating: a gripping sub sim packed with action and features

Presentation	75%
Graphics	80%
Playability	77%
Addictive qualities	75%
OVERALL	77%

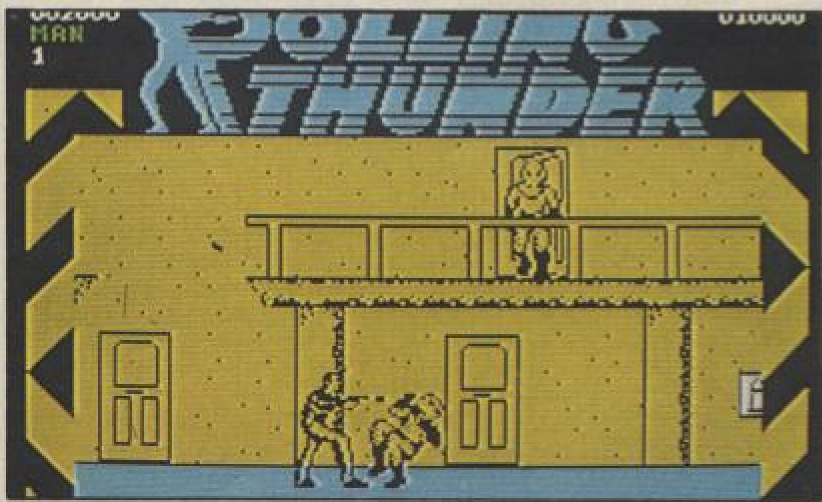
ROLLING THUNDER

Producer: **US Gold**
Retail price: **£7.99**

Geldra, another ruthless megalomaniac, controls a secret organisation that threatens world domination and the like. He and his evil crew must be stopped before it is too late, as usual.

So top agent Albatross is assigned to penetrate the headquarters of Geldra's gang.

But this is going to be no mere perambulation through ten



▶ **Ruined by a single fault?:** *Rolling Thunder*

horizontally-scrolling levels of a secret organisation's HQ before confronting the leader in a final showdown, oh no. Crawling from the woodwork and dashing from doors are hordes of Geldra's hooded thugs who, we are told, 'will shoot, punch and drop bombs on you, inexorably draining your energy'. (Look – they weren't hired to be original, right?)

But Geldra's crew is not the only obstacle Albatross must overcome. Automatic lasers with deadly fire, and a lava pool with a vicious complement of 'fire-men', await the secret agent. And Albatross has just four lives to take him through the network of passageways, doorways and balconies.

With reactions the speed of light, Albatross can easily leap above or duck beneath a hail of bullets, and he carries a pistol and a machine gun.

CRITICISM

● " This is so frustrating! The game structure is appealing (if unoriginal) but the action is annoying. It's not as though *Rolling Thunder* is easy to begin with – not only do you have to watch out for the enemy getting too close, but you've also got to keep a lookout for bullets you can hardly see.

Otherwise it's fair: the characters are reasonably well-drawn but jerkily animated, and the backgrounds are more functional than decorative, simple line drawings set in gaudy colours.

But forget the passable graphics – *Rolling Thunder* is marred by tedious gameplay. Why do you have to get sent right back to the start of a level whenever you're killed?

The potential is there for a really smart game; perhaps if it had been playtested more *Rolling Thunder* would have realised that potential rather than failing this way. "

GORDON **34%**

● *" I'm very impressed with this – but most players will find it very, very hard.*

It's a simply-laid-out but expansive (especially in the second area) platform shoot-'em-up. There's not much colour, but it's well used – creating very detailed and varied impressions. And the sound effects break up the monotony of running (Impossible Mission-style) and often hint at what Geldra's guards are going to try next.

I didn't get even the slightest bit infuriated with this very enjoyable game, despite the 'going back to the start' syndrome that annoyed other reviewers – mind you, I am pretty good at it! "

PAUL **59%**

COMMENTS

Joysticks: Kempston, Sinclair
Graphics: jerkily-animated main characters, simple backgrounds
Sound: a couple of interesting tunes, with good sound effects
General rating: a sound, traditional idea let down by gameplay problems

Presentation	63%
Graphics	57%
Playability	45%
Addictive qualities	44%
OVERALL	47%

P·L·A·T·O·O·N



► Swamped by difficulty in the tunnel section – but the battle of *Platoon* has only just started



Vietnam – a hellhole where life can be erased by one careless move.

Into the nightmare world of Oliver Stone's Oscar-winning film (see Film-makers' Vietnam Victory with this review) steps a unit of American soldiers, some afraid, some just plain crazy, but all unprepared for what they are to find.

In this multisection licensed version of the film, a unit of five must make its way through six sections of Vietnamese landscapes, along jungle paths, secret tunnels and mazes, and survive skirmishes in a bunker and a foxhole.

Each soldier carries grenades and a rifle with limited ammunition as he battles his way past hidden snipers, enemy soldiers dropping from trees and foot patrols, trying to avoid concealed booby traps that fill the first section of jungle paths and the Vietnamese village.

In this region, the unit must collect a box of explosives and look for a bridge, eventually blowing it up. The soldiers must then make their way to a village, and search huts for a torch and map before entering an underground tunnel network beneath the village.

Besides normal directional movement, each soldier can leap upward and duck down to avoid enemy fire, and enter and leave village huts. When he enters the huts, the walls become transparent, revealing the objects within.

For every enemy plugged by bullet or busted by grenade and object collected, points are awarded. These can be added to considerably by destroying the bridge and booby traps and completing the section with as many men as possible still left alive. Each soldier can take four hits before being listed as killed in action.

But the morale of the unit depends upon how many men



► Much more than a shoot-'em-up

NUMBER 50

Producer: **Ocean**
Retail price: **£9.95**
Authors: **Original version Zach Townsend, conversion by S Pearce and D Lyttle**

have been shot and the number of innocent Vietnamese civilians hit in skirmishes. And if morale falls too low, the unit is lost.

By controlling one unit member and then another, the player can maintain morale by avoiding the imminent death of a seriously wounded man in the squad; food and medical supplies can be found and picked up, and are best given to those most in need.

When the entry into the tunnel system beneath the village is found, one soldier can enter. He must be constantly aware of potential enemies, who can suddenly appear brandishing guns or knives from the clammy water through which he wades. When enemies appear, the soldier halts and the player's control switches to his gun, which is aimed using a cross-haired sight.

After finishing off an enemy soldier, the American GI can move on to scour the rest of the network. A map showing his location is on the right-hand side of the split screen, and following it can lead to rooms. Each room can be searched and any objects found there – such as the box of flares and compass necessary for the next section – examined.

But caution is essential – some interesting crates conceal booby traps.

The tunnels' exit leads into a large bunker, the next sector of the unit's mission – the American soldiers are resting here for the night when the enemy Vietcong attack. The unit fires flares high into the night sky, each burst revealing the enemy's positions.

But the light is only temporary and must be used to advantage by quickly positioning a rifle's cross hairs on the semihidden enemy and firing.

When the flare dies and darkness falls again, the enemies' position is only revealed by muzzle flash. And if members of the unit squander their flares and ammunition they become sitting ducks.

As the next day rises, the five GIs are caught in an aerial bombardment of napalm fire – from their own side. Safety must be reached as swiftly as possible. Using the previously recovered compass, unit members must avoid streams of bullets, mines and barbed wire, and take out enemy snipers, to make their way through long tracts of jungle. And the route to safety must be chosen with care: take too long, and all is lost.

The *Platoon* mission is now nearing its end, but a final stage remains. One of the unit, Sergeant Barnes, has maliciously allowed another Sergeant to be killed by the enemy – and now tries to eliminate potential witnesses by firing on the rest of group from a foxhole.

The crazed NCO is well dug in, but the others need that foxhole if they are to survive a napalm assault only minutes away. Machine-gun fire is ineffective against the foxhole, so it must be stormed using grenades. Five direct hits dispose of Barnes and save the platoon.

" I thought Ocean could never capture the feel of the film – but the programmers have overcome the problems admirably. It's all too easy to regard Platoon **as a shoot-'em-up and it is to some extent, but if you play with that approach you get nowhere – especially in the first section.**

Every aspect is superbly done – there's weak stage that lets the others down, there are no dodgy graphics – and even the packaging is fantastic. Platoon **is one of the greatest film tie-ins on any computer. "**
PAUL **92%**

" Platoon **is well-detailed and highly addictive – but be warned that it's also extremely difficult. As you complete each stage the graphics get more impressive and the gameplay faster; the tunnel stage is the best, as guerillas armed with knives and machine guns lunge at you out of the swamp slime. The excitement improves stage by stage and this highly colourful and well-packaged game is almost faultless. "**
NATHAN **95%**

" It's all too easy to dismiss Platoon **as an overrated shoot-'em-up, but though difficulties early in the game can be very frustrating, given practice and sharp reactions** Platoon **starts to reveal its rewards. The opening jungle stage is littered with traps and hazards to eliminate the novice player, each stage provides a different time-consuming challenge.**

The graphics are mostly colourful and detailed, the only fault being slightly jerky scrolling. One of the cleverest graphical tricks is on the second stage, when you've reached the village: whenever the player enters a hut the walls disappear to show the contents of the peasant abode. It's simple but effective. And the graphics in the following tunnel stage are particularly impressive.

Ocean's claim that the game, like the film, 'focuses on the tragedy of war' is a bit dubious – it's primarily concerned with success through killing. But Platoon **is not to be missed. "**
ROBIN **91%**

FILM-MAKERS' VICTORY VIETNAM



VIETNAM VETERAN Oliver Stone's Oscar-winning film *Platoon*, released last May, provided four Ocean programmers with six months' work as they carefully recreated the environment of Vietnam, war-torn and two decades distant.

Platoon was one of the most highly acclaimed films of 1987, rewarded not only by the critics – earning four Academy Awards (Oscars) for Best Picture, Best Director, Best Film Editing and Best Sound – but also by the American public, which flocked to see how it dealt with a still-sensitive subject.

Previous Vietnam films had included Oscar-winners *The Deer Hunter* and *Coming Home*, but both dealt with the war's effect on veterans rather than the war itself – as, indeed, had the more violent *Rambo* (which also became an Ocean game).

Platoon tells the story of 'the Nam' through the eyes of 19-year-old raw recruit Chris Taylor (played by Charlie Sheen). Director/writer Stone incorporates many first-hand experiences as the teenage soldier tells of his anguish in a series of letters to his grandmother.

As the story unfolds it becomes evident that the soldiers' worst enemies are themselves. The foot soldiers (or 'grunts', as they like to be called) are split between two leaders – the aggressive hard-headed Barnes and the relaxed, and more likable, Sergeant Elias. When Elias is abandoned to the enemy by Barnes, relationships are strained.

So *Platoon*, filmed in the atmospheric jungle of the Philippines, pushes the fighting to one side and explores the emotions felt by the young soldiers of the decade-long war in which America, which eventually withdrew its forces in 1973, helped defend South Vietnam against the Communist Vietcong of North Vietnam.

The film's success has prompted Ocean and RCA/Columbia, producer of the video, to join promotional forces. The video is advertised on the game's loading screen, and the game is advertised on all *Platoon* hire videos; there's a competition in the game's packaging (with videos as prizes); and RCA/Columbia has helped promote the game through video outlets.

Platoon *comp* .... *page 92*

COMMENTS

Joysticks: Cursor, Kempston, Sinclair
Graphics: each stage has a tremendous atmosphere of its own, helped by intricately detailed backgrounds and an effective use of colour
Sound: there's a superb title tune on the 128K version, but the hip-hop in-game tune is inappropriate
General rating: very playable and very hard – one of the best film tie-ins we've seen to date

Presentation	95%
Graphics	93%
Playability	88%
Addictive qualities	93%
OVERALL	**93%**



PLATOON
THE ORIGINAL STORYBOARDS ON OFFER FROM OCEAN

[illegible] *Platoon*, a [illegible] scene: you could win the storyboards [illegible] Smash

THE FILM
'A story of death and the fear of death'

WRITTEN and directed by Vietnam veteran Oliver Stone, Platoon digs deeply into the minds and emotions of young American soldiers who fought against the Vietcong in the bitter, pointless Vietnam war of the late Sixties and early Seventies.

30 men from all walks of life make up the platoon of the title, and their day-to-day existence and fight against the enemy are closely examined through the eyes of a new recruit, Chris Taylor (played by Charlie Sheen).

Platoon is a story of death and the fear of death, based on the experiences of director Stone when he served in 'the Nam' with the 25th Infantry. Billed as the most acclaimed film of 1987 and winner of four Academy Awards, this thought-provoking movie is now available as an RCA/Columbia video (reviewed last CRASH; certificate 15).

THE COMPETITION
On offer: a collector's item

OCEAN and CRASH have teamed up to bring you the chance of **winning** a collector's item: the original storyboards for the *Platoon* game, on which the programmers planned the graphics and atmosphere of each scene.

Correctly answer the quiz set out on this page, and send your entry (on a postcard or the back of a sealed envelope) to **PLATOON COMPETITION, CRASH, *PO Box 10, Ludlow, Shropshire SY8 1DB*** to arrive by **April 5**.

Five **runners-up** will each receive a copy of *Platoon* the game, and a further five **runners-up** will each win a copy of the *Platoon* movie soundtrack album.

THE GAME
'The aim is to survive'

IN Ocean's licensed game of *Platoon*, the player is like the hero of the film – a new recruit, unprepared for the challenges of the Vietnam war.

You struggle to survive the hostilities of different environments: the jungle, a network of tunnels, a village, a bunker. And while battling against all odds you must maintain a high level of morale, avoid enemy fire (four hits and you're dead) and accomplish a mission – whether it be blowing up a bridge or clearing a safe path through enemy soldiers for your escape.

The ultimate aim of *Platoon* is to survive with your sanity and morale intact.

(Turn back one page for the Smash review.)

THE QUIZ

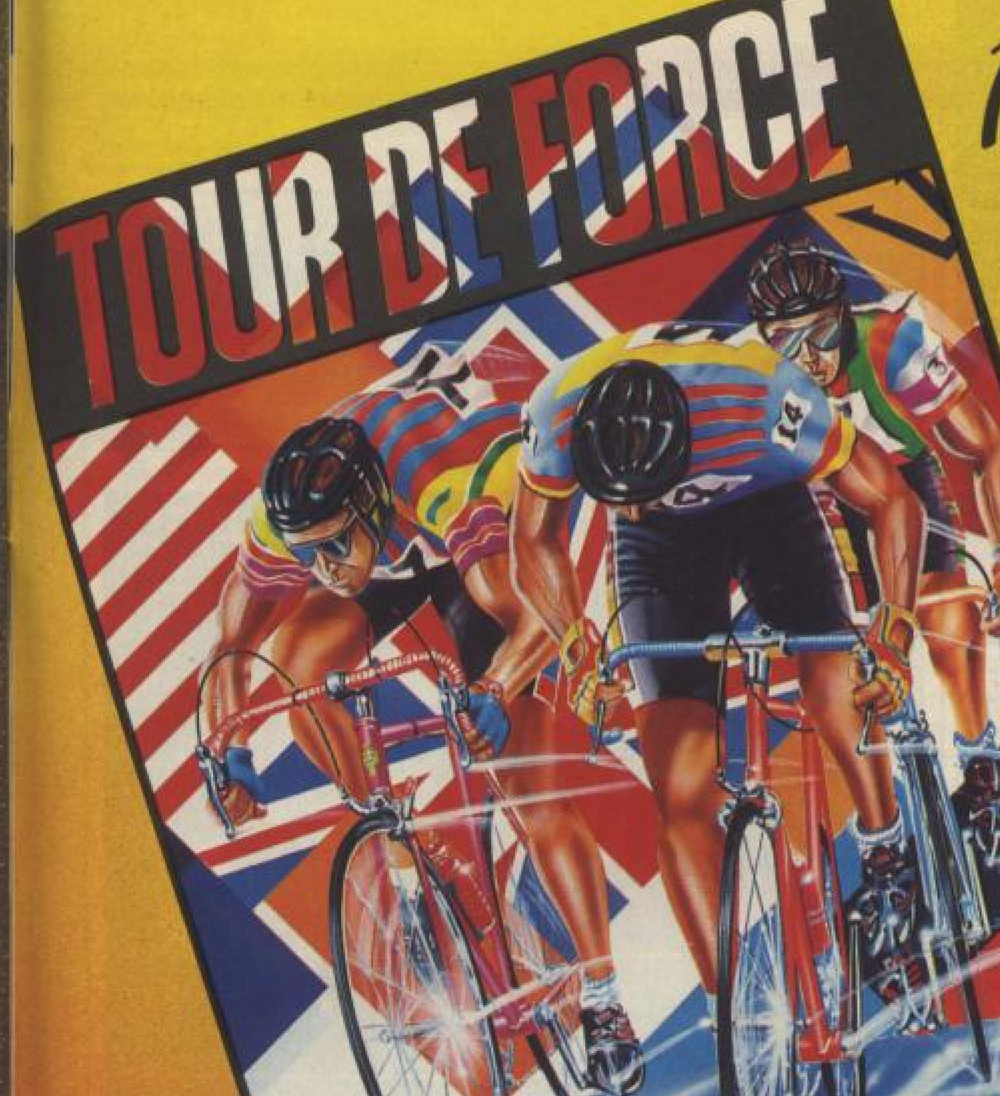
1 Name the famous father of *Platoon* star Charlie Sheen . . .

2 . . . and name the Vietnam war film in which he starred with Marlon Brando.

3 In the Vietnam war, did the Americans fight on the side of North or South Vietnam?

4 In what year did the Americans pull out of Vietnam?

5 Name the famous Vietnamese city which was the Americans' main evacuation site towards the end of the conflict.



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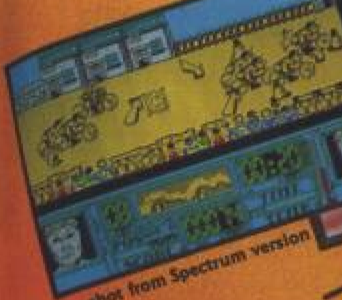
As the action heats up, the going gets tougher – your opponents don't like to see you in front, and by fair means or foul will try to hinder your progress.

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Screen shot from Amstrad version





Screen shot from Spectrum version

DUEL MASTER

....THE DEVIL WILL TAKE THE HIND MOST



BLOOD VALLEY

Archveult the hideous and mighty leader of the Firedrake has decreed that you must be hunted down like an animal and brought to sentence.

Your only chance of survival is to escape the valley. Do you have the will and resourcefulness to succeed not only against your opponent, but the creatures and eerie beings of the fantasy world of Orb as well?

"Based on the DUELMASTER series by Mark Smith and Jamie Thomson, published by Armada, part of Collins Publishing Group".

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GREMLIN

Gremlin Graphics Software Ltd., Alpha House, 10 Carver Street, Sheffield S1 4FS. Tel: (0742) 753423

MADBALLS

Producer: **Ocean**
Retail price: **£7.95**
Author: **Steve Lamb**

Dust Brain is a ball among balls on the planet Orb. But can he conquer the career mountain and become top dog on this planet of rotundity?

At least it's a bit easier than locating the voice of centrist liberalism. You see, Orb is a planet of solid platforms and black grid areas into which other Madballs can be knocked and captured by Dust Brain – to sit upon his potential planet-ruling cabinet. This hooligan political team sits in a tube beneath the main screen.

After trapping a captive from one level, Dust Brain can begin his search for another cabinet member by finding an exit and moving to the next level.

But it's 'do as you would be done by' on democratic Orb, and all the other Madballs are out to knock their compatriot off the platforms. And our hero can only survive the fall if he has already captured other Madballs – each one captured gives him an extra life.

All the Madballs interact, bouncing off each other and the scenery according to their relative speed and strength. For instance, the stronger a Madball, the more difficult it is to deflect from its path.

And trampolines, springboards, catapults, ramps, pyramids and oil slicks all can all bring a little extra bounce, speed and direction into the Madballs' lives.

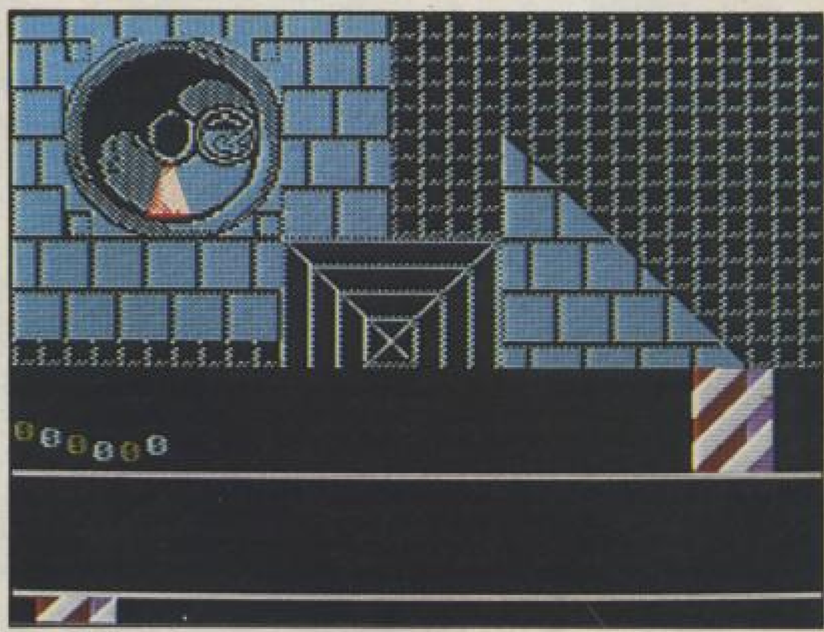
But even globes need a gobble, and the Madballs' different nutritional requirements – which range from cabbages to fish heads and bones to Coke – can be gathered to increase their energy. (Every Madball has its own energy level, indicated by a revolving striped pole.)

As Dust Brain plies his career path through this world of lovable bouncers – originally a TV cartoon, then a range of toys – he can stack up points by squashing fried eggs and knocking off Madballs and the universally hated 'undistinguished Bureaucrats'.

MIKE

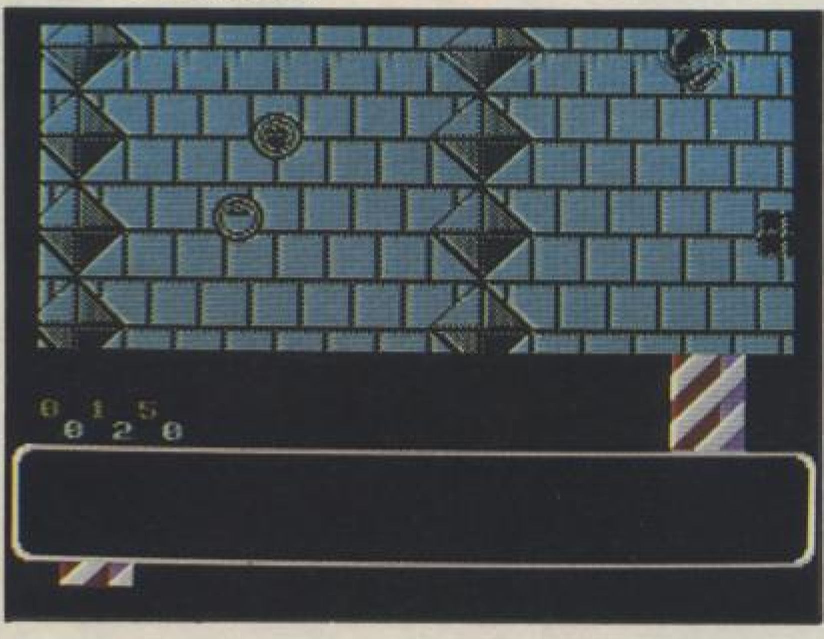
" At first Madballs **is very pleasing: the graphics are pretty, there's an excellent tune accompanying the title screen, and there's plenty to do. But the monochrome is a bit trying – all that blue begins to hurt! – and though** Madballs **is basically good the fun soon bounces away. "**

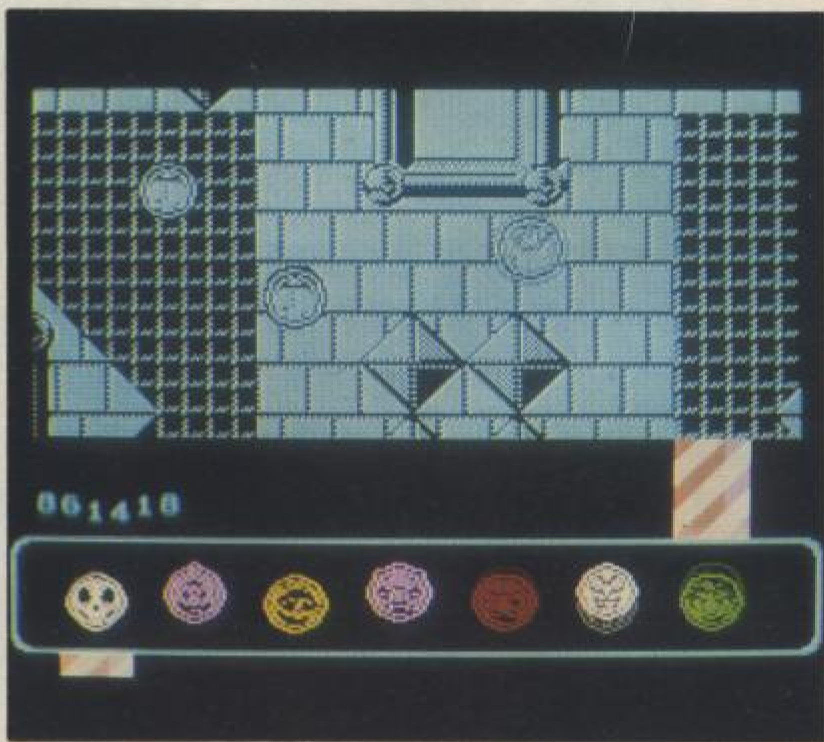
66%



► **Social democracy was never so bouncy**

► **Ball's well that ends swell**





MARK

" Like Gremlin Graphics's Smashed Bounder, Madballs **is difficult to control at first, especially as your fellow balls are trying to knock you off your rather precarious perch. But after a few games you can give the enemies a taste of their own medicine.**

The graphics are very good – the ball even appears to grow larger and smaller as it bounces up and down, in true Bounder **style. And there's a boppy little tune on the title screen and effective sproinging sound effects.**

Madballs **may not be subtle or demanding enough for some, but it's instantly playable. "**

70%

GORDON

" Madballs **is a curious licence, an odd mixture of the** Bounder **format and the** Motos**-style arcade game. It has all the ingredients of success: an interesting scenario, strong, individual characters, and excellent packaging. But the game is nowhere near as good as the promise.**

Graphically it's reasonable – the faces on the Madballs are well-animated and neatly drawn, and they have a certain cutesy appeal. The backgrounds are poor in comparison (very tediously similar landscapes with no real 3-D effect), though the scrolling works smoothly.

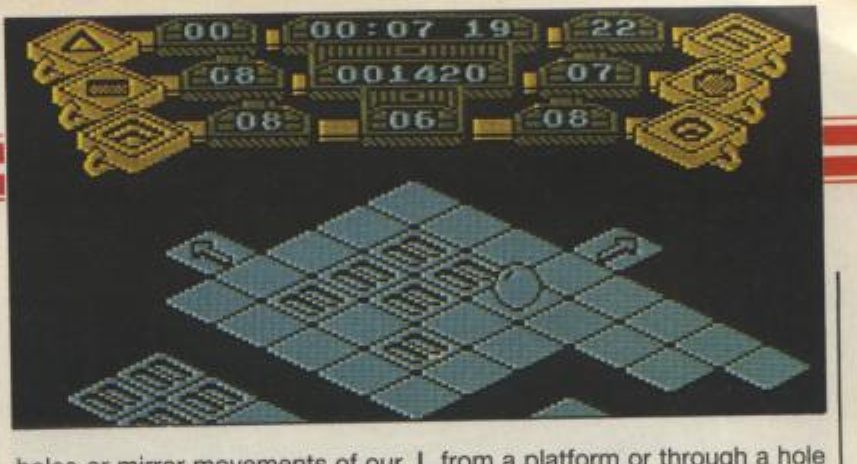
But the major letdown is the gameplay. The control-method is awkward: if you push the joystick in any direction and let go, the Madball doesn't stop but continues another inch, and this lack of precision spoils a game where accuracy of movement and positioning is called for. So you can have an awful lot of very quick and frustrating games trying to orient yourself, and ultimately Madballs **doesn't really deserve all that attention. "**

59%

COMMENTS

Joysticks: Cursor, Kempston, Sinclair
Graphics: monochromatic play area viewed from above, detailed balls
Sound: wild and wacky . . . but not very good
General rating: a good bounce 'n' bodge game, but rather unvaried

Presentation	78%
Graphics	74%
Playability	67%
Addictive qualities	57%
OVERALL	**65%**



ROLLAROUND

Producer: **Mastertronic**
Retail price: **£1.99**
Author: **Stephen Parys**

A platform world of squares and grids is the environment for a rolling ball. And the ball must move and jump from square to square, collecting the right number of crosses that he finds upon his trundling travels through *Rollaround*'s 20 levels.

The platforms do not consist entirely of identical squares; some are plain or contain collectible crosses, others alter all squares upon a level or just some. Clock squares slow down speedy aliens, and mystery squares either hide a packet of points or lead to death; unmarked exit squares when touched reveal the paths that lead to other platforms.

But things are not going to be all that easy for the ball – some platforms are patrolled by aliens. These entities can make life for a travelling sphere such a misery, as they turn otherwise solid squares into holes or push a poor ball from a platform. Others can leap over holes or mirror movements of our ball, whilst bombs can direct themselves to the squares upon which our friendly orb sits.

A jump button allows the ball to skip between platforms, avoiding these annoying creatures and collecting squares as it goes. For every one of the squares touched, points are awarded, but for fall from a platform or through a hole means that one of ball's eight lives is plucked away.

The number of types of square that need to be gathered before progress can be made to the next level is shown at the top of the screen. There is also a time countdown within which the level must be completed. When a level has been completed, there is a chance to use good timing to win a bonus score or an extra life from a random display.

MIKE

" Rollaround **is quite dull. Admittedly, the scattered cult following of the excellent** Bobby Bearing **may enjoy this mediocre reflection. But the graphics are small and lacking colour, and addictivity is very limited. "**

52%

GORDON

" Rollaround **is very reminiscent of Electric Dreams's** Spindizzy**: it has precarious 3-D landscapes and narrow tracks, items to collect, puzzles to solve and switches to throw. But it differs slightly in its overall design. It's more compact and not as well presented, and it doesn't contain the vast panorama of varied landscapes.**

But Rollaround **is very playable (dropping an alien through a hole by throwing a switch is satisfying), and the puzzle factor makes it very addictive. The title screen mirrors the game's beautiful simplicity: rolling a marble madly in search of crosses to collect doesn't create frantic action, but requires a good deal of thought and a sense of precise timing (some mapping might come in handy, too).**

The difficulty has been graded just right: the first level is extremely easy, but later ones are more demanding of precise timing and mental agility.

The only real disappointment is the graphics: they're a bit basic, and some of the aliens are very poor.

But despite these faults, if you want more of the Marble Madness **format,** Rollaround **could be what you're looking for. "**

70%

COMMENTS

Joysticks: Kempston
Graphics: isometric view of monochrome surfaces – very simple
Sound: simple sound effects
General rating: a poor *Bobby Bearing* clone of the *Marble Madness* genre

Presentation	61%
Graphics	55%
Playability	64%
Addictive qualities	62%
OVERALL	**61%**

SCUMBALL

Producer: **Bulldog**
Retail price: **£1.99**
Author: **Peter Gough**

Sewer-cleaning is not a job for the faint-hearted. You never know what you might find down there . . . well, in fact you do find rather a lot and that's the problem. LINDA is an android who can help you: LINDA has more killing power than Domestos, bleach and all other cleaning fluids put together.

She is a fearless companion but a bit of a brainless mechanism, and she needs to have her circuitry guided through the sewer network where she takes out dangerous 'germs'.

Eight grenades lie in the depths of this place, waiting for her cold metallic touch. When one of these explosive devices is collected, LINDA must take it to the lair of the green slime. And when she's got all eight, she can destroy the slime monster that lives there.

But LINDA is sure to meet a motley crew of aliens on her perambulation through the sewers. These can range from purple pythons to crabs and insects. Each brief encounter with an alien leaves LINDA a little drained, and if her power level drops to zero that's the end of her.

GORDON

" **This is an excellent little arcade adventure. It has a neat scenario, it's full of cute humour, and it's beautifully presented: the grainy fade-in of the different options screens accompanied by an appropriately crunchy sound is excellent! It's very much in the** Starquake **mould, with a small main character affected by gravity exploring a large, flick-screen alien landscape: so mapping is very much in order.**

The animation on the sprites is fabulous, and the backdrops are extremely colourful and detailed: a lot of imagination has gone into creating them.

The playability is good and fast, too – and it's very easy to control the main sprite. Scumball **could prove tedious once you've completed the task, but till then, you've got plenty of lives, there are plenty of locations to explore and enough objects to collect to ensure its lastability. Even at a full price it would be a very good game; at this price it's a steal. "**

90%

NICK

" Scumball **is a cute little game, with well-drawn graphics and smooth animation, but it lacks that extra boost that holds your attention. The little aliens all look menacing enough but when you walk into one it seems to have no effect on you at all.**

Many Mastertronic games seem to look alike these days: for instance, Universal Hero, Dynatron Mission **and this one. Perhaps Mastertronic has developed an automatic arcade-game-generator and just keeps changing the graphics . . .**

But despite all these quibbles, Scumball **isn't that bad. "**

72%

► **Neither a burrower nor a LINDA be:** *Scumball*



COMMENTS

Joysticks: Cursor, Kempston, Sinclair
Graphics: very colourful and varied
Sound: crunchy
Options: definable keys
General rating: a colourful and enjoyable arcade adventure

Presentation	85%
Graphics	87%
Playability	79%
Addictive qualities	75%
OVERALL	**81%**

MORE BALLS THAN CINDERELLA!

MICROBALL

Producer: **Alternative Software**
Retail price: **£1.99**
Author: **Steve Evans**

The pinball table awaits your pleasure . . .

A ball is fired on to a sloping table, and once on the table can't fall off – there's a surrounding retaining wall. But the ball can run through a gap at the lower end of the table, and the challenge in *Microball* – as in real-life pinball – is to use a pair of flipper-like bats to deflect the ball when it runs toward that gap. (If it does, it's lost and the next of five balls appears.)

Bounced back up the table by a flipper, the ball rebounds around a network of circular bumpers and other targets, collecting points. Hitting targets in particular combinations earns bonus points, and other targets activate a score-multiplier – it doesn't just add points but can double or even quintuple your score.

An extra ball is awarded after 250000, 480000 and 720000 points.

CRITICISM

● " As pinball games go, this isn't much fun. For a start, it's far too easy (hardly like real pinball!), and doesn't get any harder. Different table layouts, or even a single layout more complex and exciting than this, would have helped.

And though the pinball moves reasonably well, it sometimes gets stuck in places where it shouldn't (the end of the flipper, for example).

The graphics are bright and cheery, but the black background and the sound add nothing. *Microball* is quite playable (for a little while) and it does have some addictive qualities simply because it is pinball. But I wouldn't recommend it. "

GORDON **39%**

● **" Microball is another uninteresting pinball game. You remember the type: two flippers at the bottom of the screen, a few boring obstacles and a flashing display that doesn't seem to do anything. The final burst of excitement comes when you get three friends round and have a game all together!** Microball **is reasonable as pinball games go, but they don't go very far – stick with the real thing. "**

NICK **38%**

▶ **Bugged:** *Microball*



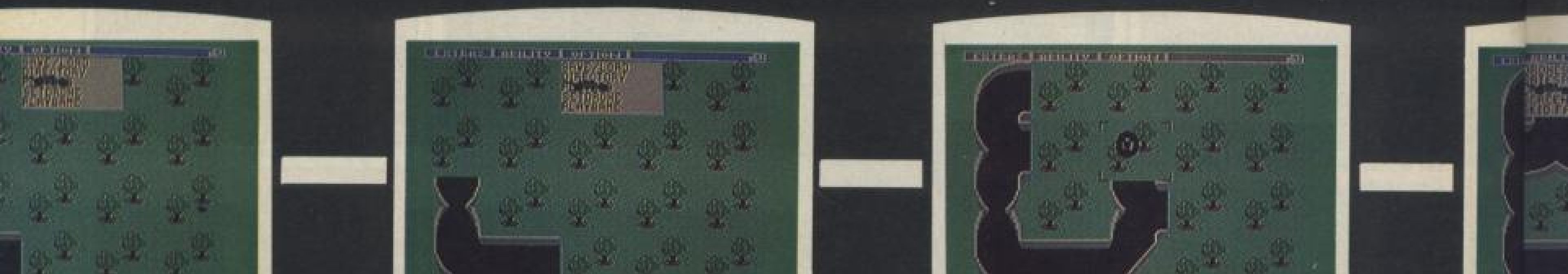
● *" I wouldn't mind a decent pinball game, something with features and graphics 1988-style, but this weak game has missed its time. Some of the bugs are appalling: the ball regularly gets stuck on the very end of the flipper (that screwup which would take considerable skill on a real table), and twice in half an hour of play the ball got stuck in the border of the 'table', necessitating reloading.* Microball *is simple and simply unattractive. "*

MIKE **47%**

COMMENTS

Joysticks: none
Graphics: simple, not unlike the real thing
Sound: simple, not unlike the real thing
Options: one to four players, if they can't be bothered to find the real thing
General rating: little content, little interest (*not unlike the real thing - Man Ed*)

Presentation	50%
Graphics	43%
Playability	55%
Addictive qualities	36%
OVERALL	**41%**



PIGGY

Producer: **Bug Byte**
Retail price: **£2.99**
Author: **Peter Watson**

Remember being a baby – those days when thumb-sucking and potty training filled your time and a tin of steamed leek, apricot and radish purée baby food was a gastronomic delight?

If you do you'll remember the nursery rhyme about the three little pigs who kept on having their houses blown down by *Canis lupus*, a wolf in Latin clothing. And you'll be thrilled to know that the eldest of those poor little porkers is still having problems.

He still wants to construct his own little two up/two down with roses round the front door. There are enough building materials and tools to gladden the heart of any navvy scattered around the piggy's world of mazes.

And, just to prove that he's really looking hard for all those building materials, when Piggy leaves the exit of one maze he can find himself transported to locations as surprising as a space port and the moon. (Look – as has been explained elsewhere in this issue, we don't write these games, OK?)

It wouldn't be so bad – for our four-trottered friend, that is – if all the piggy had to do were pick up those bare necessities. But every maze is populated by wildlife that can turn him into streaky rashers – ghosts, bees, cat's heads, stoop-backed harridans and of course Mr Wolf himself. It's enough to make even the hardiest piglet run 'wee, wee, wee' all the way home . . . if he had a home.



▶ This little *Piggy* shouldn't have gone to market

CRITICISM

● " Ha, ha, ha! Bug Byte was around at the very beginning of Spectrum time, and this looks like an unreleased 1983 game. There is a grand total of ONE joystick option, set keys, a strong contender for worst tune of the season, and graphics which are bettered by most On The Screen demos. *Piggy* is probably, along with Top Ten Hits's *Grid Iron*, the worst game I've played. "

MIKE **07%**

● **" This takes me back to the days of simple titles, attempts at loading screens, cute uncomplicated plots. And if it comes from those days, it should have stayed there: all the sprites are the same size, even the eponymous Piggy and the borders, and the tune is miserable. There's absolutely no point buying stuff like this when much better games are available at the same price. "**

NICK **09%**

● " *I'm appalled that a company such as Bug Byte, old and respected, would release such trash. As in most thoughtlessly-programmed games, the collision-detection is VERY dodgy (it's character collision, in fact). And it seems no time has been spent on programming graphics, sound and playability – so certainly no time should be spent playing with them.* "

PAUL **06%**

COMMENTS

Joysticks: Kempston
Graphics: very simple UDGs with plentiful but ugly colour
Sound: simpler than the graphics
General rating: *Piggy* is terrible – and Bug Byte must know that

Presentation	18%
Graphics	08%
Playability	08%
Addictive qualities	10%
OVERALL	7%



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LOS ANGELES SWAT

Producer: **Entertainment USA**
Retail price: **£1.99**

It's 1999. You're leading a mean squad of three dudes trained to perfection as killing machines, members of the police SWAT (Special Weapons And Tactics) division. The mission this time is to rout out a nest of terrorists in a district of Los Angeles and release their hostages.

This should have been an operation as sharp as a Bic disposable razor – well, probably a little sharper than that. But to complicate matters, a few civilians remain in an evacuated area and neither they nor the hostages must be harmed by you and your men.

Your squad is on foot patrolling through the vertically scrolling streets of LA. You control the leader of your team, who is at the front of the patrol. When the terrorists home in on him, lobbing grenades, he must move fast – and risk the hidden snipers.

If the leader falls in action, his place is immediately taken by another squad member; when he in turn needs a body bag, the final man is on his own.

Each member of the team is equipped with a gun, but only the leader's can be controlled. He can fire in the direction that he moves, and diagonally – always taking care not to hit innocent civilians, which knocks the points off him.

Reach the junction where the terrorist leader hangs out, and you'll find those hostages. Now things can really get tough.



▶ Los Angeles Sprites Wander Around Tediously

CRITICISM

● **" My,** Los Angeles SWAT**, what slow graphics you've got! My,** Los Angeles SWAT**, what limited sound you've got! My,** Los Angeles SWAT**, what ludicrous colours you use! My,** Los Angeles SWAT**, what awkward controls you've got!**
'All the better for selling me off cheaply with.' "
BYM **36%**

● *" The graphics and colour in* Los Angeles SWAT *are awful – curious checkerboard blocks are meant to represent buildings, indistinct 2-D line drawings pass for upturned cars, poorly-animated characters litter the gaudy background. If the action was more exciting this might be forgivable (as might the colour clash), but the controls are awkward, the gameplay is repetitive and even the sound is a letdown. "*
NICK ***22%***

COMMENTS

Joysticks: Cursor, Kempston, Sinclair
Graphics: poorly-defined characters, bad use of colour
Sound: very basic
General rating: a poor vertically-scrolling shoot-'em-up

Presentation	30%
Graphics	21%
Playability	31%
Addictive qualities	21%
OVERALL	**26%**

MERLIN

Producer: **Firebird**
Retail price: **£1.99**
Author: **Mike Westlake**

Merlin the magician has been absent-minded – and he's ended up searching the dank passageways of King Arthur's Camelot castle for his lost magical powers!

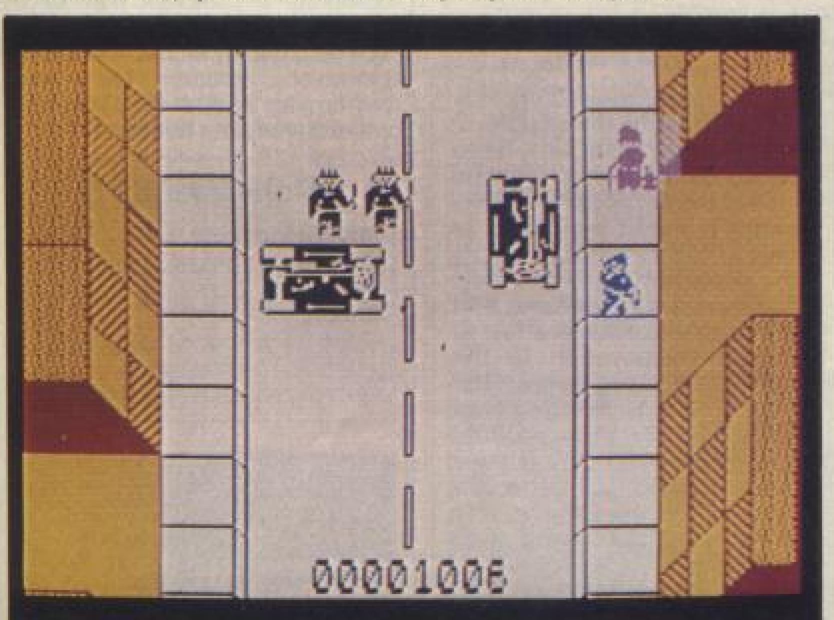
To reactivate his stock of skills that would leave Paul Daniels floundering, Merlin must collect the magic stars that lie in Camelot's horizontally-scrolling passages and rooms.

He can collect them merely by walking into them, but the positions of some are sure to test his agility, speed and ingenuity.

And Camelot is an ancient, strange and mysterious place. Bats, small ghosts and bewitched sweeping brooms occupy dark rooms, just waiting for Merlin to walk in . . .

Merlin's remaining life force is grimly displayed by an emerging gravestone at the bottom left of the screen, and he's got just ten lives to recover those lost powers – if he's ever to say another abracadabra again.

▶ Five foot two, sprite of blue . . . has anybody seen his spells?



CRITICISM

● **" The eponymous Merlin is just too big! He just towers over everything else, and you get the feeling the sprite may fall over any second. And the screens are very cluttered, with small monsters and objects all over the place . . .**

The collecting idea is old hat and boring, the title tune is very basic, but at least Merlin **is nicely colourful – if you like stray blobs of colour chucked all over the screen. "**
NICK **35%**

● *" Merlin isn't very original, a kind of latter-day* Jet Set Willy *without much of the fun. The gameplay itself is quite addictive, though I'm sure some of the rooms are impossible to complete. It's very fast-moving and requires a lot of precise joystick work – perhaps too much – but you're given plenty of lives to play with, and real progress can be made.*

But don't be fooled by the screenshots on the inlay: the graphics are big, bold and colourful, with varied and interesting backdrops, but when the sprites start to move it's a different story. Glitches in the animation and a kind of 'transparency' afflict them – and because of this it's ludicrously easy to hide from ghosts.

So though there are lots of locations to explore, the simple idea doesn't hold long-term rewards – and the minimal instructions don't help much. "
GORDON **53%**

COMMENTS

Joysticks: Kempston, Sinclair
Graphics: large, colourful, but very slow and flickery
Sound: irritating
General rating: a simple collecting game with too many graphical problems to be really playable

Presentation	33%
Graphics	57%
Playability	41%
Addictive qualities	39%
OVERALL	**40%**

ENERGY WARRIOR

Producer: **M.A.D. X**
Retail price: **£2.99**
Authors: **Binary Design**

It is the year 2079, and the decaying, polluted earth values more than ever its precious few acres of unspoiled nature. As a warden, you are responsible for maintaining the health of one such area.

At first all you had to do was some tidying up and the herding of animals, but now things have changed. A distant star has become a supernova, and Wavaren, creatures that inhabited one of its encircling planets, have found a new home – in your reserve. So your job description has been rewritten to include their destruction.

The reserve consists of forest, ocean islands and rocky desert; these three regions are further divided by force fields into ten areas, with aura energy maintaining their original condition in each. But the presence of Wavaren reduces this energy, and if it it ever reaches zero level the area dies. And if three of a region's areas are wasted this way, you've lost.

The Wavaren fly around in an aerial cornucopia of jellyfish, fairy cakes, molecules and rotund craft, showing off and manoeuvring around your small fighter as it skims above the horizontally-scrolling landscape.

Your fighter is equipped with forward-firing lasers – it may take a few blasts before some robot craft succumb – and several blitz bombs that annihilate all the Wavaren onscreen.

When some Wavaren vehicles are destroyed, a series of icons temporarily appears and other sections can be reached, your life substance increased, extra bombs acquired or your fighter's power improved.

They never told you environmentalism would be like this when you joined the Green Party . . .



► Wavering Wavaren warfarin' – but wait till you see the B-side!

CRITICISM

● *" Though graphically quite good, with neat backgrounds,* Energy Warrior *has little content. Horizontally-scrolling shoot-'em-ups are all very well, but unless there's some remarkable feature they can be quite dull and unplayable. "*

MIKE **40%**

● **" Energy Warrior is a pretty ordinary horizontally-scrolling shoot-'em-up, quite playable but offering nothing original. There are plenty of landscapes but they're all slightly too easy to complete: it's just a matter of finding a safe place and learning the attack formations, which soon becomes tedious.**

Graphically it's reasonable, with smooth but slow scrolling and fairly well-drawn and detailed sprites (they're a bit bland, though). The backgrounds are colourful and varied, though slightly garish, and each level has its own character and atmosphere.

Molecule Man, the B-side game, is much better. "

GORDON **50%**

COMMENTS

Joysticks: Kempston, Sinclair
Graphics: slow scrolling, good varied backgrounds
Sound: pip pip!
Options: 'free' B-side maze game, *Molecule Man* (85% Overall in Issue 30)
General rating: far too easy, but maybe worth getting for the 'free' game!

Presentation	43%
Graphics	53%
Playability	45%
Addictive qualities	40%
OVERALL	**45%**

BMX KIDZ

Producer: **Firebird**
Retail price: **£1.99**
Authors: **Zeit Corporation**

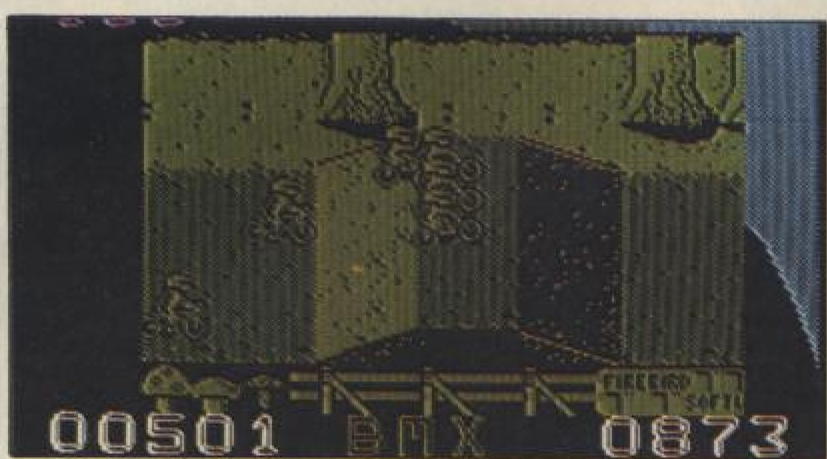
All that practising on your BMX would make even the hardest bottom saddle-sore – but it's worth it if it helps you beat the BMX Kidz.

Six tracks await your wheels. Each has a series of undulations and leaps for you to negotiate and a clutch of fellow BMXers to compete against.

Riding your bike brings on quite a sweat, and every pedal rev uses up more of your energy. Those falling reserves need to be promptly replenished with some hefty swigs of Coke. Cans of this brown, fizzy beverage stand on the track and these are collected by riding into them.

But energy isn't all that you have to worry about, for though your wheels are sturdy, they can't stand too much punishment. Crash down hard on them after a high leap, and the spokes break very easily. Replacement wheels, like the cans, can be gathered at various points along the way. The number of spokes that your bike has available are shown at the top left of the screen.

And there's always that ticking clock, counting away those precious seconds that remain to complete the course. If the first track seems hard, it's an easy ride compared with what comes after. Each extra foray on the BMX course becomes much harder, and your fellow competitors have become much better, jostling you for the Coke cans and spokes which they can all too easily deprive you of. To add further to your difficulties, you need to complete a sufficient number of 'tricks' such as wheelies and other stunts to qualify for the next round. However spend too long performing and all the Coke and wheels are taken by the others.



ROGER

" I've seen a lot of games (particularly budget games) using the theme of BMX racing bikes, but BMX Kidz **is actually enjoyable to play! It incorporates many smart touches such as riding straight through larger-than-life cans of Coke for more energy. The game gets really really addictive when your energy is at its full potential and whenever you go over a ramp your rider just flies over all the other competitors. Though** BMX Kidz **is extremely addictive the graphics get a little confused when the race is at its most exciting, and the game needs a rousing tune. But** BMX Kidz **is one of the best budget bicycle motocross games on the market. "**

68%

BYM

" The small play area cramps the game and the graphics. Had more room been allocated to the game and less to the scores and energy meter it might be easier to enjoy BMX Kidz**. Despite this the game is still great to play. Controls are responsive and the cute graphics are fun to watch. Desperation is the main part of the game. You rely on no-one drinking your Coke (spot the product placement). So when your energy brings you close to a halt and all the other riders drink your Coke the situation gets dire. "**

71%

COMMENTS

Joysticks: none
Graphics: confusing and inaccurate
Sound: none
General rating: a poor but playable imitation of Mastertronic's *Kikstart II*

Presentation	61%
Graphics	65%
Playability	69%
Addictive qualities	76%
OVERALL	**69%**

KIKSTART II

Producer: **Mastertronic**
Retail price: **£1.99**
Author: **Paul Murray**

D-biking is a sport for those with nerves of steel, terrific bike control, and the strength to survive being thrown off their machine countless times.

NICK

" Once you've mastered the controls and adjusted your eyes to the colour Kikstart II **is quite playable. But the course designer is extremely hard to control, and it's irritating when you can't turn it off and go back to the game, though some good designs can be created.**
The presentation of Kikstart II **is good, with an excellent title screen, and you soon get used to the slow scrolling. Yet with much more exciting racers like** ATV Simulator **on the market this can only be a second choice. "**

62%

In *Kikstart II*, the sequel to *Kikstart*, two riders compete on a horizontally-split screen. each crossing an identical course of awesome obstacles ranging from simple, rough terrain and steep ramps to rows of pounding pistons and incinerating plumes of flame. Springboards can send a biker high into the air, gates and brick walls require steady riding, mud patches that can bog down the best.

So each rider must control his bike with skill, accelerating and braking, doing wheelies and jumping high when required. Only experience can teach you which riding technique is required when.

MIKE

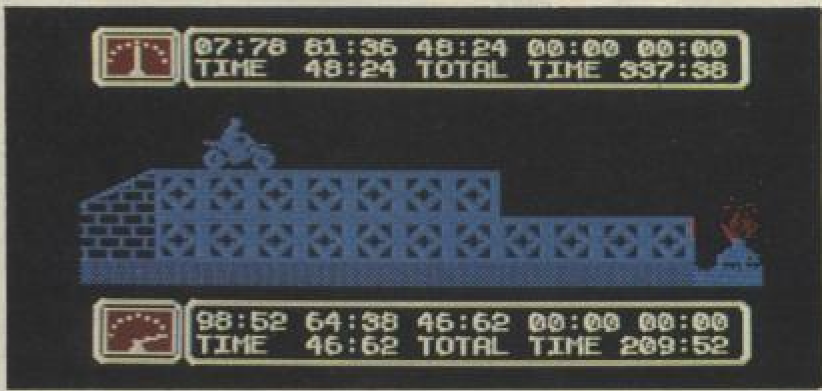
" Kikstart II **is everything** Code Masters's ATV Simulator **should have been. The lack of sound is annoying (the Commodore 64 version has an excellent tune) but the rest of the game holds up superbly. It's playable and addictive, with good and surprisingly smooth graphics and little colour clash.**

92%

At every riding session five courses from a possible 24 can be chosen or randomly selected; a target time is given for each course together with a total for all five.

No matter how many times the riders take a tumble, they always remount – no lives are lost. But valuable time speeds on at twice the normal rate.

Using the course designer you can redefine keys, construct a new course or modify an old one, and set up obstacles to provide the most testing of dirt-bike challenges. The new or modified course replaces one of the original rides.



COMMENTS

Joysticks: Cursor, Kempston, Sinclair
Graphics: unbearably slow scrolling of a detailed but colourless background
Sound: silent 48K version, simple 128K tune
Options: definable keys; course designer
General rating: only the course designer gives this simple game long-lasting appeal, and only Mike's Smash rating caused this high Overall percentage

Presentation	72%
Graphics	67%
Playability	79%
Addictive qualities	76%
OVERALL	**77%**

JET BIKE SIMULATOR

Producer: **Code Masters Plus**
Retail price: **£4.99**
Authors: **The Oliver Twins**

Skis and BMX bikes are things of the past for Code Masters – now the kings of low-rent simulations are zooming into a new label on jet bikes, personal skimmers of the future.

The rider stands on a jet bike's back as it slips across the water's surface. And *Jet Bike Simulator* offers 24 courses, with settings that range from lakes and coasts to docklands. In each the jet bike must be steered around numbered floating buoys, taking them in sequence, to complete a lap.

There's a strict time limit, so luckily control of the jet bike is simple. But forward thinking is required for successful steering: the jet bike can, under thrust, overshoot a corner and head in an entirely inappropriate direction.

GORDON

" Behind the self-congratulatory inlay, the excessive hype and the amateurish poster of bestubbled yuppies lurks a very good game.
The presentation is excellent, with a wide range of options, speedy loading of new courses and a large, informative and colourful display. And there's a wealth of circuits and graded difficulty levels which are genuinely different and challenging.
But graphically Jet Bike Simulator **is inconsistent. Using arrows to represent jet bikes just isn't good enough, though the trails they leave in the water are effective, and the backgrounds range from abysmally indistinct to very pretty.**
The control method is the standard Code Masters inertial sprite-guidance system given a couple of tweaks; it's very frustrating to begin with, but addictive once you can start anticipating obstacles and speeding around them.
There are two major criticisms, however. The drones always take the same route, so there's no real racing; and the £4.99 Code Masters Plus price is too high for this kind of essentially simple game, add-ons and difficulty levels notwithstanding. "

76%

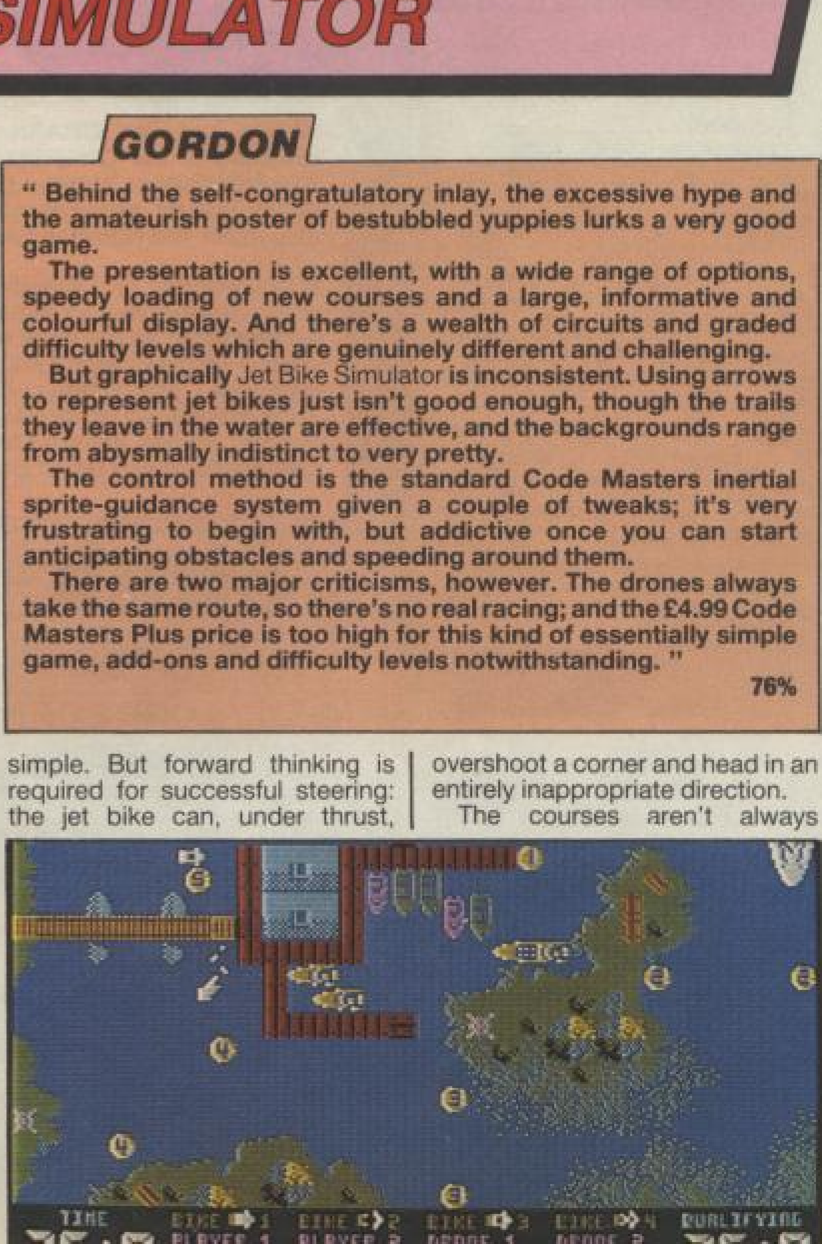
NATHAN

" Jet Bike Simulator **is a very fast, all-action colourful creation. Manoeuvring the jet bikes is difficult at first – they tend to slide about all over the place – but getting the speed and skilful swerves right is all part of the fun. I loved** Jet Bike Simulator, **though I didn't win a race! "**

75%

The courses aren't always simple, and a skilled jet biker can navigate around bridges, leap over aquajumps and avoid great clogging banks of weed.

After the completion of a course, a performance table gives the lap times of the player(s) and the computer-controlled drone racers, the best recorded lap times, and scores and time bonuses.



COMMENTS

Joysticks: Cursor, Kempston, Sinclair
Graphics: small and indistinguished; there's lots of colour but the bikes get lost in the white dots (spray) they create
Sound: crackly speech on the title screen, acceptable title tune, poorly-used spot effects
Options: standard and expert (more difficult) versions – the Plus aspect of Code Masters Plus; one or two players; action-replay option
General rating: this is a good treatment of the jet-bike theme smothered with presentation, but the basic game is too much like *BMX Simulator* and *Grand Prix Simulator*

Presentation	80%
Graphics	67%
Playability	72%
Addictive qualities	78%
OVERALL	**75%**

the CRASH CHARTS



TOP GAMES MARCH

The three charts compiled from the votes of CRASH readers are the most realistic way of gauging the popularity of Spectrum games – it is the games that are being played that get the votes, not the games that are in the shops this week or month.

And the votes are important. It's up to you to let us know what you feel, so fill in the voting forms which live on the results pages to make your voice heard.

If you don't want to carve up your issue of CRASH, we understand. Use a photocopy if you like, or copy the details from the voting forms onto a postcard, or the back of a sealed envelope, and send that to us instead.

Apart from the satisfaction of registering your vote, there's always the chance of winning a prize. Each month we draw 15 winners from all the voting forms received – five for the HOTLINE, five for the ADVENTURE and five for the STRATEGY chart.

A top prize of £40 worth of software (your choice, not ours) and a CRASH T-shirt is awarded to the first slip drawn from the HOTLINE votes, and another £40 of goodies and a shirt goes to the ADVENTURE and £40 of goodies and a shirt goes to the STRATEGY.

Four runners-up from each ballot box collect a CRASH T-shirt and a CRASH Hat. So get those votes in to the **CRASH HOTLINE CHART**, **CRASH ADVENTURE CHART** and **CRASH STRATEGY CHART**: *PO Box 10, Ludlow, Shropshire SY8 1DB.*

Match Day **was CRASH readers' all-time Number One (as revealed in the Christmas Special), and the sequel has gone STRAIGHT IN at Number One! (At least we Smashed it, unlike its distinguished predecessor . . .) The Ocean/Imagine grouping also holds the Number Two spot with the streetwise** Renegade.

R Kunikowski ***of Coventry lists*** *Gauntlet, Zynaps,* ***and*** *Enduro Racer* ***among his top five favourites. And just for the trouble of writing them on the back of a postcard he gets this month's first prize – software worth £40. The four lucky runners-up, who each receive a T-shirt of their choice (so long as it's a CRASH one), are*** John Macintosh ***of Glossop in Derbyshire;*** Neil Comerford ***who, like the winner, lives in Coventry;*** John Burnham ***of Stamford in Lincolnshire; and*** David Brown ***of Stanford-Le-Hope.***

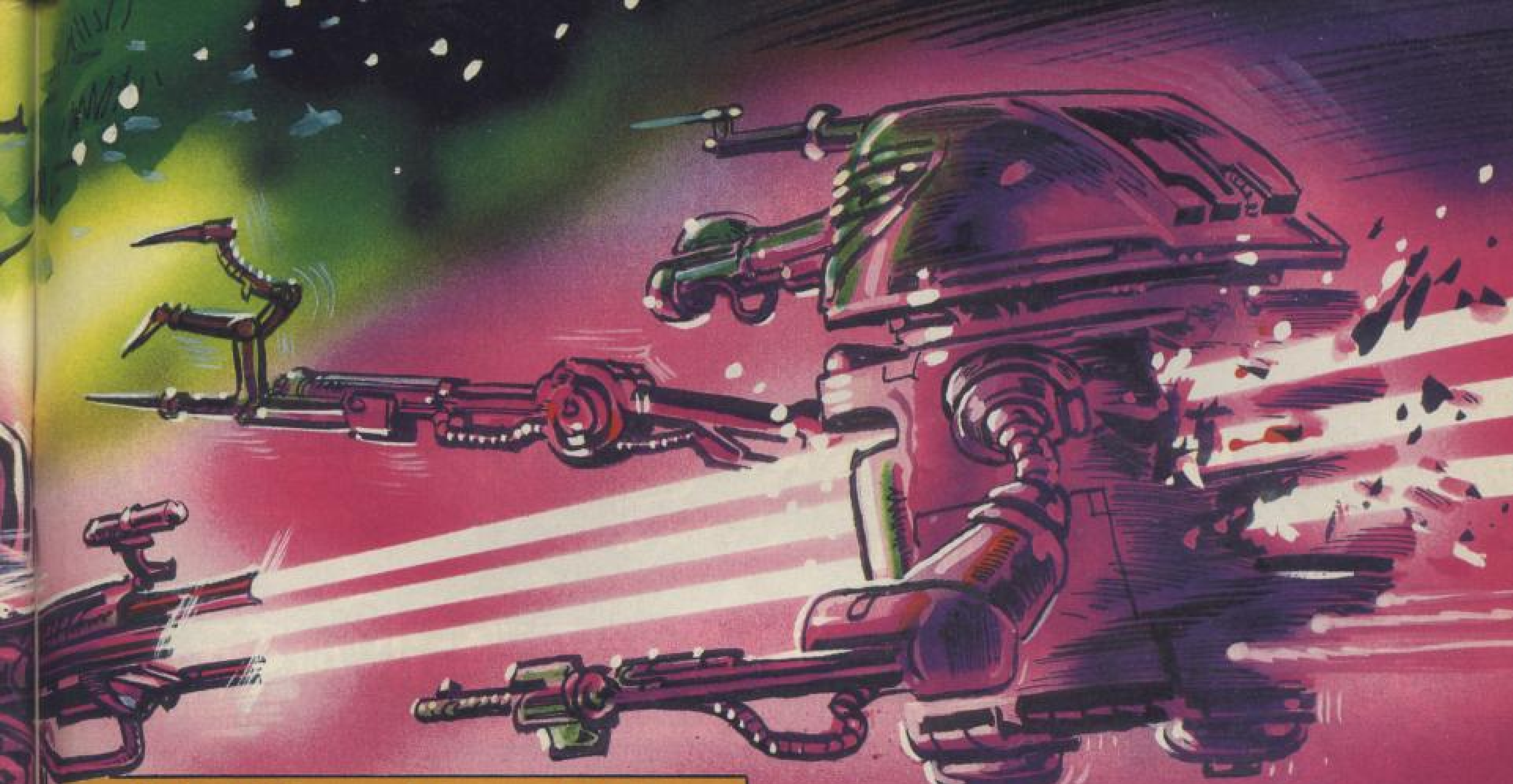
Sometimes they go up, and sometimes they go down – but very rarely do strategy games actually leave or enter this quiet chart. Vulcan, **with 16% of the vote, has little problem holding on to the Number One spot.**

Tom Holstein ***wins the top prize, and runners-up are*** S A Rogers ***of Poole in Dorset;*** Nathan Hill ***of Woking;*** A Morgan ***of Fakenham in Norfolk; and*** William Craigens ***of Middlesbrough.***

Remember – top prizes for all three charts are £50 next month! Grab the chance, and post your votes soon.

Strategy Top 10

1 *(1)*	**VULCAN**	CCS
2 *(3)*	**LORDS OF MIDNIGHT**	BEYOND
3 *(2)*	**ARNHEM**	CCS
4 *(6)*	**DOOMDARK'S REVENGE**	BEYOND
5 *(4)*	**DESERT RATS**	CCS
6 *(5)*	**REBELSTAR RAIDERS**	FIREBIRD
7 *(8)*	**THEATRE EUROPE**	PSS
8 *(9)*	**TOBRUK**	PSS
9 *(10)*	**THEIR FINEST HOUR**	CENTURY HUTCHINSON
10 *(7)*	**BATTLE OF BRITAIN**	PSS



Hotline Top 20

1 (►)	MATCH DAY II	OCEAN
2 (5)	RENEGADE	IMAGINE
3 (1)	EXOLON	HEWSON
4 (4)	ENDURO RACER	ACTIVISION
5 (3)	GAUNTLET	IMAGINE
6 (2)	ZYNAPS	HEWSON
7 (6)	HEAD OVER HEELS	OCEAN
8 (-)	COMMANDO	ELITE
9 (7)	MATCH DAY	OCEAN
10 (►)	OUT RUN	US GOLD
11 (12)	ELITE	FIREBIRD
12 (9)	STARGLIDER	RAINBIRD
13 (14)	PAPERBOY	ELITE
14 (11)	COBRA	OCEAN
15 (8)	BUBBLE BOBBLE	FIREBIRD
16 (10)	MERCENARY	NOVAGEN
17 (19)	QUAZATRON	HEWSON
18 (►)	DRILLER	INCENTIVE
19 (15)	BARBARIAN	PALACE
20 (►)	THUNDERCATS	ELITE

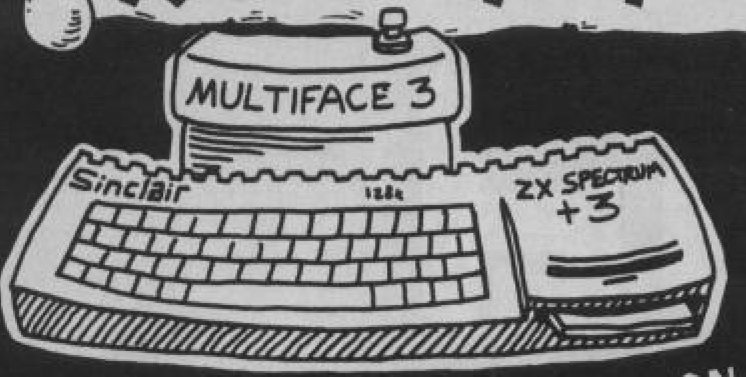
Adventure Top 20

1 (1)	THE HOBBIT	MELBOURNE HOUSE
2 (4)	LORDS OF MIDNIGHT	BEYOND
3 (3)	STORMBRINGER	M.A.D.
4 (2)	SPELLBOUND	M.A.D.
5 (5)	DOOMDARK'S REVENGE	BEYOND
6 (15)	THE PAWN	RAINBIRD
7 (6)	THE BOGGIT	CRL
8 (11)	RED MOON	LEVEL 9
9 (7)	KNIGHT TYME	M.A.D.
10 (9)	HEAVY ON THE MAGICK	GARGOYLE GAMES
11 (8)	LORD OF THE RINGS	MELBOURNE HOUSE
12 (10)	THE BIG SLEAZE	PIRANHA
13 (14)	FAIRLIGHT 2	THE EDGE
14 (-)	KILLED UNTIL DEAD	US GOLD
15 (12)	GREMLINS	ADVENTURE INTERNATIONAL
16 (13)	DUN DARACH	GARGOYLE GAMES
17 (20)	DRACULA	CRL
18 (-)	NEVER ENDING STORY	OCEAN
19 (-)	THE PRICE OF MAGIK	LEVEL 9
20 (-)	BORED OF THE RINGS	CRL

Not much change this month – the top five places only wiggle around a bit, with The Hobbit **still leading the way. One surprise:** The Pawn **from Rainbird bounding up the chart to Number Six. US Gold's** Killed Until Dead **still hasn't made its mind up – it's been in and out of the charts for months.**

Anthony Woodcock ***of Wakefield*** **gets the big prize, and** Thundercats, Renegade **and** Athena **are among his choices.** ***(Wakefield's obviously a bit of a violent area.) Four fortunate adventurers are runners-up: a Welshman,*** **Martin Owen** ***of Gwynedd; a Cockney,*** **Robert Caldecott** ***of London SW18; a Northerner,*** **Paul Ratcliffe** ***of Barnsley; and a Southerner,*** **J Comax** ***of Windsor.***

1988 – THE YEAR OF THE ROBOT



SPECTRUM+3 – THE BEST ADD-ON FOR MULTIFACE 3

NOW YOU HAVE

"A GOOD REASON TO BUY SPECTRUM+3:" (Crash)

multiface three

"THE PLUS 3 DISC SOLUTION" (Sinclair User)

In the beginning there was the Spectrum. Lots of people bought one. Lots of other people wrote games for the Spectrum, and lots of people bought those as well.

But there was a snag – everything used cassette tapes, which were fine for *Depeche Mode* but not for so hot for computer software. Slow, unreliable and frustrating were some of the kinder terms used for the medium.

Now there's the 128K+3, a games machine that has all its software on tape and built in disc drive . . . Guess what Romantic Robot has produced?

Multiface 3, that's what. Plug it into your 128K+3, and load a game from tape. Press the red button and you can port it on to disc at any stage, yours to load in a trice at a whim's notice. Multiface works by waiting for the program to load and run. Then it takes a copy, and as the program was running at the time, it will run when the copy is loaded back later.

The tape to disc function of the Multiface 3 would be enough to recommend it to anyone. But there's more. When the red button is pressed, a whole range of functions appears. You can look through the 128K+3's memory, altering it at will. High scores have never been so easy to obtain. Memory can be displayed as hexadecimal, decimal or text. All of the 128K+3's 128K of Ram can be fiddled with, not just the 48K's worth that Basic has access to.

You can also print out areas of memory and screens in a variety of different forms. The Multiface 3 can do the same types of graphics dumps as its brother Multiprint, straight text, Spectrum-style *Copy* and a couple of shaded screen dumps. It can't do much more than 128K+3 Basic does, but it does it in the middle of programs.

The main purpose of the Multiface is to get things on to disc. As well as the simple *Save* and *Load*, it's got a few other tricks up its interface. You can, for example, use the disc from 48K mode. Lots of people get excited by this.

Other things that the Multiface can do is allow you to erase a file to make room on a disc, in case you need to save something in mid-game and can't get to Basic to do the deed. You can't *Format* a disc from the Multiface, alas.

Multiface also compresses stuff automatically, and doesn't *Save* empty areas of memory. These two features mean that you can get (for example) more than three games on the 170-odd K allowed you per disc side. But you can turn those features off, if need be.

Everything is accessed by the traditional one- or two-line menu and single keypresses. Multiface 3 is very careful about invalid inputs, and didn't crash or otherwise misbehave at all. And I did try to confuse it.

More than that, what can I say? I enjoy a good rant, most reviewers do, but the Multiface 3 seems set on continuing the Romantic Robot tradition of doing the job reliably. I can't even complain a little.

Any 128K+3 owner will find it a wonderful device, indispensible even – I'm not giving mine back without a fight. I expect to see the usual extra programs appear for the best in due course (Genie et al), whereupon not owning a Multiface 3 will brand one a complete loser■

EXCERPTS FROM REVIEW IN



LIFEGUARD is an infinite life finder. Install it into the MULTIFACE 1 or 128, load a game, press the MULTIFACE's button and LIFEGUARD is ready to look for infinite lives, ammunition, etc. Once it finds it, your playing and score will never be the same – you'll win again and again –

and for £6.95 ONLY!

All prices valid strictly by mail-order 1.3.1988 – 30.4.1988. GENIE works with MULTIPRINT, MULTIFACE 1 and 128 only. Programs saved by MULTIFACE 3 and tapes saved at hyper speed by MULTIFACE 128 do not run independently.

THE YEAR OF THE ROBOT · BE PART OF IT

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SPECTRUM 48K with Interface, Microdrive, 115 cartridges, Interface 3 and over 500 games. All for £200. Tel: 01 857 8429 ask for D Collins.

48K SPECTRUM Interface 1, Microdrive, Joystick, Lightpen, Mouse with Artist II, Sound Sampler, Currah Microspeech. Worth over £630 with over 30 original games. Will sell for £320. Tel: 0302 66220 ask for Nick.

GOOD HOME NEEDED for a 12 month old Spectrum 128K. Also includes 5 128 games free. If interested contact: Russel on 0480 300456 after school hours. £100 the lot.

SPECTRUM 48K with over £200 worth of original software. A bargain at only £75 ono. Tel: 0625 585465 ask for David.

SPECTRUM Interface, Microdrive, Multiface, Joystick, Tape Recorder, over £350 software including *Sentinel*, *Mercenary*, *Nether Earth* and *6-Pak* worth over £650 only £165. All boxed. Phone: 0628 72184 ask for Damon.

FOR SALE Rotronics Wafadrive with seven 64k wafers, plus Multiface 1, worth £60. Phone: 0494 712895 ask for Raymond.

SPECTRUM 128/48K for sale. Includes 12 B/W T.V., Seikosha Printer and Serial Printer, Tape Recorder, Light Pen, Joystick and Interface plus £1000 worth of software. Will sell for £550 ono. Tel: 0535 681691 after 6pm, ask for Mr R Davies.

FOR SALE 48K Spectrum with Saga 3 Elite keyboard. DK double Joystick, Interface, Games, Tasword, Processor, Kempston Centronic Printer Interface, Reset Switch, worth £330. Price £150. Also Rotronics Wafadrive with seven 64K wafers, plus Multiface 1. Worth £100, sell for £60. Tel: 0494 712895 ask for Raymond.

A BRILL 48K SPECCY for sale, with many many games, all packed for £100 ono. So write now to: Michael Beake, *79 Sinclair Avenue, Banbury, Oxon OX16 7BQ*. Tel: 66374.

ZX SPECTRUM for sale. Kempston Interface, Gunshot Joystick, *Spy Hunter*, *Daley Thompson's Decathlon* and a few £1.99 games. All for just £40. Tel: Medway 65937 ask for Matthew.

SPECTRUM 128 with Cheetah Joystick plus Interface. Also over £500 worth of software and Data Recorder. Will accept £180 ono. Brilliant condition. A great big bargin. Tel: 0642 564207 ask for Glen.

SPECTRUM PLUS for sale. Ram Turbo Interface, Quickshot Joystick, original games valued at over £100, including *Paper Boy*, *Great Escape* and *Micronaut*. £120 ono for all. Tel: 0663 42433 ask for Stephen.

SPECTRUM 48K plus Tape Recorder, 53 new original games including, *Cobra*, *Gauntlet*, *Great Escape* and many more, plus magazines. Worth £200 sell for £100. Tel: 0784 253543 ask for Gary.

SPECTRUM 2 Cheetah SpecDrum, Light Pen, Joystick, Adaptor, 40 tapes including *Art Studio*, *Star Glider*, *Gauntlet*, *T.T. Racer* and books. Excellent condition, only 10 months old £215 ono. Tel: 0428 713034.

MULTIFACE 128 for sale, unused and still boxed, worth £45. Will sell for £25. Nigel Palmer, *20 Glenalmond, Norwich, NR4 3AG*.

SPECTRUM 128 for sale with joystick double interface, dust cover, £170 of software including *P.A.W*, *Barbarian*, *Vulcan*, and Micronet One Musical Keyboard extra. Tel: 02918 207 ask for Nicholas.

MULTIFACE 128 for sale (£45) 3 months use. Unwanted gift, will sell for £30. Tel: 0442 485000 ask for Andrew.

SPECTRUM 2 over 45 games £120. AMX Mouse, Art Studio £35. Opus Disc Drive Discs £70. Kempston Printer Interface £25. All excellent condition. Tel: 0670 72214 ask for Jamie.

FOR SALE SPECTRUM 128 Tape Player (all boxed), manual and over 100 games all worth about £700 - offers around £300. Tel: 0949 43065 ask for Ian.

SPECTRUM 48K cassette recorder, interface, joystick, nearly 100 games including, *Exploding Fist*, *Uridium*, *1942*, *Space Harrier* and *Commando*, also manuals. Good condition, only £75. Delivery possible. Tel: 01 232 1988 Day or 01 237 3970 evenings. Ask for I Hussein.

SPECCY 128 guaranteed 8 months, boxed. As new plus Joystick, Interface, over 110 original games including, *Star Glider*, *Tai Pan*, *Silent Service*, *Vulcan* and *Dracula*. £220 ono. Write to: Ron Allen, *156 Longshaw Drive, Worsley M28 6BB*.

GETTING 3 so accept £115 ono for Spectrum 48K, Multiface 1, Cheetah Joystick, Wafadrive, word processor, 64K Wafa, Leads, Manuals and £50 worth of games. Tel: 01 657 5152 after 4.30pm ask for Gary. Might split.

MINT 128K plus Low Profile Recorder all boxed, £500 of original software, £100 of books and mags. Total value £800, offers arund £300 to £350. Write to: John Morton, *7A Balfour Street, Burton Upon Trent, Staffs DE13 0TT*.

ROTRONICS WAFADRIVE £25 128K Wafer. Top games including, *Enduro Racer*. Datel Joystick Interface £5. All new and working. Write to: Chris Jackson, *3 Albion Terrace, Lexham Road, Litcham, Kings Lynn, Norfolk PE32 2QQ*.

SPECCY Rubber Keyed, Backpack (On/Off, Save/Load Switches, Volume Control), ZX Printer with 5 rolls of paper, Cassette Recorder, 100 games, Crash mags 16-45. £100 the lot. Postage paid! Tel: 033483 8901 evenings, ask for Lee.

SPECTRUM Cassette Deck, Joystick, Double Interface, Multiface 1, 120 games, 119 mags in binders. All for £350. No offers. Write to: John Russell, *95 Woodside Avenue, S.Benfleet, Essex SS7 4NU*.

SPECTRUM boxed with Joystick Interface, over £300 worth of software, printer, Joystick and mags. As new, worth over £500, sell for £120. Write to: G Bockley, *72 Appletree Gardens, Walkerville, Newcastle Upon Tyne NE6 4SU*.

HARDWARE WANTED

WANTED 48K SPECTRUM with joystick and interface, in good condition for about £20 - £30. Preferably in reasonable distance from Nailsea, Nr.Bristol. Tel: Christian Kent on 0272 852244.

WANTED MULTIFACE 1 with instructions, must be reasonable. Also interface 1 and microdrive. Tel: 0222 560253 (ask for Steffan).

MULTIFACE 128 Geniesoft coare plus instructions. Willing to pay between £30 - £40 or any reasonable offer. Contact: Mark on 021 7782014, after 5pm.

WANTED MICRODRIVE or interface or both! Does not matter what condition. Would swap for Light-Pen cursor interace joystick. Write to: J P Calvert, *43 Windermere Avenue, Queens Park, London NW6 6LP*.

WANTED any Spectrum compatible modem with subscription, if possible. No idea of how much, open to offers. Tel: 0934 416258 and ask for Alistair.

WANTED Brother HR5 Printer, if possible and interface. ink ribbon. Phone: 0383 823441, ask for Jonathan. Will pay £50 ono.

MIDI KEYBOARD WANTED possibly MK5 or other if compatible with music machine. Tel: Derby 840275 at weekends or after 5pm on weekdays. Ask for Philip.

WANTED VTX5000 MODEM plus AMX Mouse (complete). Will swap for top Spectrum software. Write to: Anthony Brooks, *66 St.Johns Road, Staveley, Nr.Chesterfield, Derbys S43 3QW*.

SINCLAIR ZX PRINTER WANTED Will pay £15 for a good working printer with paper and manual. Phone: 061 775 5303. Ask

for Darren between 4pm and 6pm if you can help.

WANTED any DOT Matrix Printer interface for the Spectrum. Make me an offer. Write to: Tony Evans, *40 Lindfield Avenue, Blakelaw Est, Newcastle Upon Tyne NE5 3PJ.*

WANTED RAM MUSIC MACHINE and any software to go with it, or amateur programs and any information on software such as 8-Tracks. Contact: Russell Burke, *4 Donside, Gateshead, Tyne and Wear NE10 8RE.*

WANTED any good printer and interface. Also games to sell or swap including: *Living Daylights, Army Moves.* Tel: 0273 685767 after 6pm or write: Stuart Gould, *48 Coldean Lane, Brighton, Sussex BN1 9GE.*

WANTED SPECTRUM 128 with cassette player, interface and joystick plus games. Reasonably priced, good condition. Close to Enfield area. Tel: 01 805 6591 ask for Tony Ponti.

HARDWARE WANTED Want to have all your hardware, even defect! Will swap for Software. Write to: J Ten Hagen, *Von Bonninghausenlaan 7, Lisse 2161 ES, Holland.*

HOMEGROWN SOFTWARE

FAST HOME GRAPHICS DESIGNER design up to 16 x 16 graphics, multi option, 100% machine code. Send £2 or £1 + tape and S.A.E. to: Peter Tilley, *Nirvana, Bolingy, Cornwall TR6 0AT.*

FINAL WHISTLE a six-a-side football management game, featuring named and recorded scorers, player status, save game. £2.50. Write for details to: Impetus, *10 Ashkirk Road, Normandy, Middlesborough, Cleveland TS6 0EW.*

ADVENTURE GAMEBOOK AID no more need for pen and dice, just a Spectrum and gamebook. Send S.A.E. £1.50 for cassette to: A.G.A. *52 Hillcrest, Loughton, Essex IG10 8PS.*

PBM

BOXING PBM send S.A.E for details to: Luca, *26 Shakespeare Avenue, Hayes, Middx UB4 0BL.* Reply now to ensure your place.

IF YOU'RE A COWBOY or an Indian then don't hesitate. Enter your dreams. Send a S.A.E. for details of *Cowboy* PBM to: Grant Cargill, *10 Cliffburn Road, Arbroath, Argus, Scotland DD11 5BB.*

CHAMPIONS a great new soccer simulation. Including European Ties, Internationals cup competition. Full league action. Send a S.A.E to: Mike Busson, *32 Beverley Road, Ruislip, Middx HA4 9AW.*

PBM FORTUNE A world of high adventure featuring game graphics and player profiles. Write for details to: Foruna, *PO Box MT34, Leeds LS17 7UF.*

THE ARMAGEDDON GAME A game of leadership, diplomacy, economics, espionage and nuclear warfare. Only 50p per turn (weekly) send £1 start-up to: TAG *21 Winchester Avenue, Penylan, Cardiff, Wales CF3 7BT.*

PEN PALS

15 YEAR OLD MALE seeks Pen Pal of the same age. Every one answered. Write to: David Burke, *48 Purley Oaks Road, Sanderstead, Surrey CR2 0NR.* Pen Pal must be a girl!

19 YEAR OLD FEMALE would like male or female Pen Pals aged 19 to 25. I own a Spectrum +2. Please send a photograph if possible. Kim, *12 Meadow Close, Cromer, Norfolk NR27 9JF.*

16 YEAR OLD MALE looking for female Pen Pal the same age or 15 years. Write to: Stuart Pollard, *63 Avondale Road, South Croydon, Surrey CR2 6JE.*

WANTED FEMALE PEN PAL aged 13-16 years to share Speccy and general interest. Write to: David Forsythe, *3 Como Road, Forest Hill, London SE23 2JL.* Photograph if possible.

14 YEAR OLD LAD wants male or female Pen Pal. Your list of games for mine, to swap. Andrew Doherty, *Barn Cottage, Squires Lane, Old Clipstone, Nr Mansfield, Notts NG21 9BP.*

FEMALE PEN PAL wanted age 14/15 (must live abroad). Please include photograph if possible. All letters will be answered. Write to: Richard Lawson, *97 Cyrano Way, Grimsby, South Humbs DN37 9SQ.*

MALE GRAPHIC ARTIST 35, Spectrum owner, seeks male/female pen friend. Also interested in creating unusual software. Preferably Wales, Cornwall, Scotland, Ireland areas. Write to: P. Jones, *138 Cimla Road, Neath, W.Glamorgan, S.Wales SA11 3UD.*

SOFTWARE SALES

FOR SALE brand new games, hardly played. *Living Daylights* and *Survivor.* 50p each, receipts included. Contact: Robert Hember, *48 Hazelton Road, Marlbrook, Bromsgrove B51 0JE.*

SPECCY SOFTWARE for sale. *Exolon* £5, *Catch 23* £5, *Mad Max* £4, *Contact Sam Cruise* £4, also *Inspector Gadget* not yet released in England £8. Phone: Andy McMillan on 061 7667034.

FIVE GREAT GAMES on one tape: *Footy, Argo, Top Dog, Lazer Ride* and *World Series Cricket.* It's a bargain at only £5.95. Write to: N Humphreys, *Penrhyncoch Post Office, Aberystwyth, Dyfed SY23 3EH.*

FOR SALE SOFTWARE and mags. *Renegade* £3, *Nipper 2* £4. I have all the Crash, Your Sinclair, Sinclair User and C&VG mags. Mark Hunt, *59 Hood Close, W.Croydon CR0 3SR.*

48K GAMES FOR SALE from 50p! All originals. Write to: Kevin Goldsbrough, *5 Lime Avenue, Darlington, Co.Durham DL1 3AN.* Or Tel: 0325 488196 after 8.15pm and ask for Kevin.

GAMES FOR SALE *Quill, Illustrator* and *Patch* £10 the lot. *Feud, Amaurote, Motos* and *Zub* £5. *Star Glider* £5, *Tomahawk* £3, *S & S* £3, *White Lightening* £3. Kempston Interface £3 and many more. Tel: 0239 78379 ask for Rick.

FOR £3.50 *Top Gun, Paper Boy* and *Infiltrator.* For £2.50 *Dragons Lair* and *Spy Hunter.* £4 for *6Pak.* For a list send a S.A.E to: James Laus, *98 Washington Road, Woodthorpe, Notts NG5 4NR.*

SALE package of 16 Spectrum games, including: *The Hobbit, Starstrike, Superbowl* and *Swords & Sorcery.* Worth £115, will sell for £40. Phone: 0251 263798 after 4.30pm or weekends and ask for Roger.

FOR SALE *Academy, Tau Ceti, L.O.M, Avalon, Spitfire 40* and *Their Finest Hour* all £5. *G.A.C.* £9, *Doomdark's Revenge* £6. Contact: David Adams, *9 San Jose Close, Mount Road, Hastings, Sussex TN35 5PJ.*

FOR SALE *Killed Until Dead, Great Escape* and *Vampire,* all for £11. Phone: Grimsby 51000 anytime and ask for Paul.

SOFTWARE FOR SALE from £1 - £5. Includes *Dan Dare, Elite, ID* and many others. Originals only. Please send for list. Write to: Philip Latham, *10 Hazlemere Avenue, Macclesfield, Cheshire SK11 8LZ.*

SOFTWARE SWAP

G.A.P SOFTWARE SWAP. Get rid of your unwanted pieces of software for new ones, cheap. For details send S.A.E to: G. Briggs, *14 Riby Court, Holton-Le-Clay, Grimsby, S.Humbs DN36 5BT.* Please write soon!

WILL SWAP *Hydro Fool, War, Xevious, World Games* or *Avenger* for *Road Runner, Rana Rama, Terra Cresta, Into The Eagle's Nest* or *Top Gun.* Phone: 0705 737411 ask for Brian.

A LOT OF latest titles to swap. Send your list for mine. Write to: Declan Mulligan, *68 Bolton Park Road, Whitehall, Dublin 9, Ireland.*

SWAP ANYTHING DECENT for any of the following: *Zub, Great Escape, Bobby Bearing, Storm, Pyracurse, Quazatron, Super Sleuth, Amautrote* and *Mind Shadow.* Tel: 0223 834877 after 5pm ask for Matthew.

WILL SWAP recent games like *Death Wish III* and *Renegade* and tons of others. Phone: 01 468 7380 ask for D J McGrath.

WILL SWAP *Amaurote, Strike, Feud* and *The Master* for *How To Be A Complete Bastard, Head Over Heels* and *Leader Board.* Originals please. Eddie Scant, *26 Jubilee Crescent, Arniston, Gorebridge, Midlothian EH23 4XB.*

LOTS OF GAMES to swap, old and new. Send your list for mine. Also wanted *Wonder Boy* and *Super Bowl.* Write to: Tom Gibbins, *130 Outer Circle, Taunton, Somerset TA1 2BY.*

GREAT TITLES such as *Uridium, Bobby Bearing, Enduro Racer, Now Games One, G.A.C.* and others. Would like *Exolon, Head Over Heels, Elite* and *P.A.W.* Tel: 0652 33435 ask for Martin.

LOTS AND LOTS of games to swap. Send your list for mine. All letters will be answered. Write to: Timo Partala, *Papinkatu 8 A19, 33900 Tampere, Finland.*

WANTED *Chaos* and or *Theatre Europe.* Willing to swap games such as *Zynaps, Exolon, Rats, Vulcan, Aliens* and more. Write to: Colin McLachlan, *Stirling, Central Scotland FK7 7DT.*

WILL SWAP *Top Gun* for *Head Over Heels.* Contact: Keith Lloyd, *50 Princes Boulevard, Bebington, Wirral, Merseyside L63 5LW.*

SWAP *Dragon's Lair I* and *Fairlight 2* for *Glider Rider, They Stole A Million, Into The Eagle's Nest* and *Avengers.* Swap one for one. Contact: David Cockayne, *87 Ogley Road, Brownhills, Walsall, West Midlands WS8 6BD.*

HAVE YOU GOT *Tai Pan, Leader Board* or *Star Glider?* If you have I will swap you *6Pak* or *Now Games IV* (includes Dan Dare). Contact: Chris Dempsell on 0204 791002.

Send S.A.E to: Dave Keith, *248 Pappert Estate, Bonhill, Alexandria, Dunbartonshire G83 9LQ.* For full list.

SOFTWARE WANTED

WANTED *Renegade,* will swap for *Winter Games* and *Bruce Lee* or for *The Great Escape.* If interested, please Phone: Dominic Hogan on 0442 833121.

WANTED *Elite* by Firebird. Will swap for *G.A.C, Game Over, I Ball, Turbo Esprit, Storm Bringer* or any combination. Must be in very good condition. Contact: Simon Hooper, *54 Elm Tree Close, Kingsbury, Nr.Tamworth, Staffs B78 2JG.* Tel: 073722.

OTHER

AMAZING OFFER over 90 pokes on one tape. Pokes for all the latest games, fully comprehesive instructions. Send £2 and a S.A.E to: P. Torr, *9 Redlake Meadow, Bucknell, Shropshire SY7 0AY.*

ATTENTION SPECTRUM OWNERS hardware, games and mags for sale. For further details Tel: Newcastle 2674045 or write to: Wayne Green, *5 Clipstone Close, Throckly, Newcastle Upon Tyne E15 9LU.*

FOR SALE One Off Road Radio Controlled Car. Only car, not controls, scale speed 28 M.P.H., chunky tyres, uprated springs, stickers. Just over a year old £35. Tel: 0424 32444 ask for Nigel Bell.

SPECTRUM PLUS £55. Ram Turbo Interface £13. Lots of software for sale or swap for R.P.G stuff. Also lots of magazines for sale. Tel: 01 801 0125, ask for David.

+3 OWNERS Character designer to create, save, load, sets to disc or tape. On tape for only £1.75. Send cheque to: Mark Joyce, *103 Maldon Road, Witham, Essex CM8 1HP.*

BARGINS GALORE plus fabulous range of homegrown software, all in Chic Computer Club's Winter Newsletter. For free copy Tel: 0753 884473 or write to: Steve Winter, *28 Criss Grove, Gerrards Cross, Bucks SL9 9HQ.*

ARTIST, a great detailed art program. The programm works with Currah Speech. For listings send £1 Postal Order to: Jamie Snape, *25 Shear Bank Road, Blackburn, Lancs BB1 8AP.*

SORRY! FULL UP

Overwhelming response to the CRASH Classifieds means we can't print a form for your free ads this issue – there's such a backlog waiting to get in the magazine. Just keep your assets frozen for another month . . .

CRASH COMPETITION



ROMANTICALLY YOURS

WITH

ROMANTIC ROBOT

VALENTINE'S DAY, The Year Of The Robot and our Tech Niche Supplement – well, we couldn't resist it, we just had to have a Romantic Robot competition!

For years Romantic Robot has been at the forefront of hardware-development on the Spectrum. In fact, the Robot team has produced so many useful add-ons we couldn't decide what to give away in this competition.

But one thing we *could* be sure about: everybody could use a **Videoface Digitiser** for capturing those magical moments of TV on your Spectrum screen. This complex gadget will (combined with a video recorder or video camera) provide hours of fun for anyone with the slightest artistic bent – you can capture a picture from real life, play with it as a Spectrum graphic, and send the altered image in to On The Screen!

The Videoface Digitiser is also very useful for creating those realistic backgrounds in games – many large software houses use it.

So one little black box will be on its way to the **winner** of this word-square competition.

CHOICE OF PRIZES!

Five second-prizewinners will get their choice of prizes: either one of Romantic Robot's famous **Multiface** series, or a **Multiprint** printer interface. (For words on those, see the Plug-in Potential section in this month's Tech Niche Supplement – just a few pages on.)

And a further **30 runners-up** can choose one of the following **software** prizes: *Wriggler* (an Issue 15 CRASH Smash maze game); *Music Typewriter* (a clever little utility for composing music); *Lifeguard* (a handy infinite-lives-finder for hacking addicts); and *Genie* (a disassembler).

(Please note that *Lifeguard* and *Genie* will only work with a Multiface One or Multiface 128 – they're no use without the hardware!)

THE TEST OF LOVE

You don't have to be a technical genius to win these fantastic prizes. In the word square are hidden ten hardware-related words – running backwards, forwards, up, down and even diagonally. Just find them all, put a line through each, and complete the tie-breaker in no more than ten words by coming up with the most cleverly amusing sentence you can devise.

Fill in the form below – ticking one box in each of the two prize sections – and send off your entries to **ROMANTICALLY MINE COMP, CRASH, *PO Box 10, Ludlow, Shropshire SY8 1DB*.**

Entries must reach us by **April 5**, and the decision of CRASH's appointed judges is final (rule-breakers will be digitised and have their pixels pulled out one at a time).

If I win a second prize I'd like to get Romantic with (tick one):

Multiface One ☐
Multiface 128 ☐
Multiface 3 ☐
Multiprint ☐

But as a runner-up I'd be just as happy to receive (tick one):

Wriggler ☐
Music Typewriter ☐
Lifeguard ☐
Genie ☐

Remember: to use Lifeguard **or** Genie **you must have a Multiface One or Multiface 128!**

Now solve the word square . . .

E	R	R	O	K	V	Z	X	O	L
L	C	P	E	L	G	E	N	I	E
E	S	A	L	T	F	G	O	J	X
P	L	I	F	O	S	N	R	A	I
H	T	O	B	O	R	I	Z	Y	P
A	I	L	E	O	E	W	G	N	M
R	G	B	P	R	A	D	G	E	A
R	R	G	I	S	R	O	I	T	R
A	A	H	S	C	Q	O	R	V	J
Y	P	A	G	I	N	G	R	F	D

And complete the tie-breaker with up to ten words . . .

Romantic Robot are so old they ....

....

NAME ....

ADDRESS ....

....

.... **POSTCODE** ....

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Finally, there's a personal computer that not only solves problems like other computers, but also solves the one problem that other computers have created. Affordability. Silica Shop are pleased to present the ST range of personal/business computers from Atari. The ST was designed utilizing the most recent breakthroughs in semiconductor technology, producing a personal computer that performs tasks with fewer parts. Which means it costs less to make. And less to buy. The latest ST computers now include built in power supplies and built in disk drives. The TOS operating system and GEM window environment are now on ROM chips which are already installed in the ST keyboard. This enables automatic instant booting when you switch on. Silica Shop are pleased to offer the complete Atari ST range. Our mail order department is situated in Sidcup and we have 3 retail outlets at Sidcup, Lion House (Tottenham Court Rd) and Selfridges (Oxford Street). We have eight years experience of Atari products, longer than any other UK company, and are well established as the UK's No.1 Atari specialist. With a group turnover of over £9 million and in excess of 80 staff, we offer you unbeatable service and support. We provide several facilities which you will find invaluable during your Atari computing life and most of these facilities are available **ONLY FROM SILICA**. We suggest that you read through what we have to offer, before you decide where to purchase your Atari ST.

FREE STARTER KIT - Only From Silica

When you purchase any Atari ST keyboard, you will not only receive the best value for money computer on the market, but you will also receive the following from Atari Corporation as part of the package:

** BASIC Language Disk * BASIC Manual * ST Owners Manual * TOS/GEM on ROM*

If you buy your ST from Silica Shop, you will also receive:

** NEOchrome Sampler - colour graphics program * 1st Word - Word Processor*

In addition, we at Silica would like to see you get off to a flying start with your new computer, so we have put together a special **ST STARTER KIT** worth over £100, which we are giving away **FREE OF CHARGE** with every ST computer purchased at our normal retail prices. This kit is available **ONLY FROM SILICA** and is aimed at providing users with a valuable introduction to the world of computing. We are continually upgrading the ST Starter Kit, which contains public domain and other licensed software, as well as books, magazines and accessories all relevant to ST computing. Return the coupon below for full details.

DEDICATED SERVICING - Only From Silica

At Silica Shop, we have a dedicated service department of seven full time Atari trained technical staff. This team is totally dedicated to servicing Atari computer products. Their accumulated knowledge, skill and experience makes them second to none in their field. You can be sure that any work carried out by them is of the highest standard. A standard of servicing which we believe you will find **ONLY FROM SILICA**. In addition to providing full servicing facilities for Atari ST computers (both in and out of warranty), our team is also able to offer memory and modulator upgrades to ST computers.

1Mb RAM UPGRADE: Our upgrade on the standard Atari 520ST-M or 520ST-FM keyboard will increase the memory from 512K to a massive 1024K. It has a full 1 year warranty and is available from Silica at an additional retail price of only £86.96 (+VAT = £100).

TV MODULATOR UPGRADE: Silica can upgrade the 1040ST-F to include a TV modulator so that you can then use it with your TV set. This is an internal upgrade and does not involve any untidy external boxes. A cable to connect your ST to any domestic TV is included in the price of the upgrade which is only £49 (inc VAT). The upgrade is also available for early 520ST computers at the same price.

THE FULL STOCK RANGE - Only From Silica

We aim to keep stocks of all Atari related products and our warehouse carries a stock of over £1½ million. We import many software titles direct from the USA and you will find that we have new releases in advance of many of our competitors. Unlike dealers who may only stock selected titles, we have the full range. In addition, we carry a complete line of all books which have been written about the Atari ST. A range as wide as ours is something you will find is available **ONLY FROM SILICA.**

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Rest assured that when you buy your ST from Silica Shop, you will be fully supported. Our free mailings give news of releases and developments. This will help to keep you up to date with new software releases as well as what's happening in the Atari market. And in addition, our sales staff are at the end of a telephone line to service all of your Atari requirements. If you purchase an ST from Silica and would like any technical advice, we have a full time technical support team to help you get the best from your computer. Because we have both the staff and the systems specifically dedicated to providing after sales service on Atari ST computers, we are confident that our users enjoy an exceptionally high level of support. This can be received **ONLY FROM SILICA**.

FREE CATALOGUES - Only From Silica

At Silica Shop, we recognise that serious users require an in-depth information service, which is why we mail free newsletters and price lists to our ST owners. These are up to 48 pages long and are crammed with technical details as well as special offers and product descriptions. If you have already purchased an ST and would like to have your name added to our mailing list, please complete the coupon & return it to us. This information service is available **ONLY FROM SILICA**.

FREE OVERNIGHT DELIVERY - From Silica

Most orders are processed through our computer within 24 hours of receiving them. Most hardware orders are sent by the overnight GROUP 4 courier service FREE OF CHARGE to customers within the UK. This method helps to ensure minimum delay and maximum protection.

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We hope that the combination of our low prices, FREE UK delivery service, FREE Starter Kit and FREE after sales support, will be enough to make you buy your Atari equipment from Silica Shop. If however, there is something you wish to purchase, and you find one of our competitors offering it at a lower price, then please contact our sales department, providing us with our competitor's name, address and telephone number. If our competitor has the goods in stock, we will normally match the offer (on a 'same product - same price' basis) and still provide you with our normal free delivery. We realise that we are not the only company who will match a competitor's price. However, if you come to us for a price match, you will also be entitled to our after sales service, including free newsletters and technical support. This makes our price match promise rather special, something you will receive **ONLY FROM SILICA**. We don't want you to go anywhere else for your Atari products. So shop at Silica, the UK's No1 Atari Specialist.

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LONDON **01-580 4839**
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LONDON **01-629 1234 ext 3914**
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MEGA ST's NOW IN STOCK

For the user who requires even more RAM than the 520 or 1040 ST's offer, the new MEGA ST computers are now available. There are two MEGA ST's, one with 2Mb of RAM and the other with a massive 4Mb. Both new computers are fully compatible with existing ST's and run currently available ST software. The MEGA ST's are styled as an expandable Central Processing Unit with open architecture and a detachable keyboard. They are supplied with GEM, a free mouse controller and all extras as with the 520 or 1040. Prices are as follows:

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If so, which one do you own? ....

PREVIEW

Coming soon to a Spectrum near you!

SPRINGTIME SOFTWARE

BE PREPARED for an **Activision** attack! ***Championship Sprint***, which should be available now for £9.99, is the follow-up to Electric Dreams's coin-op conversion *Supersprint* (58% Overall in Issue 46). The basic game is very similar to the original, but the programmers have listened to criticisms of *Super Sprint* and produced a far superior version. With the circuit designer up to four tracks can be designed at a time – complete with ramps, gates and short cuts.

Also from Activision there's ***The Last Ninja***, which could be out any time now.

But we'll have to wait till March for the next batch of releases. The first is ***Gee Bee Air Rally***, a flight simulator based on the famous Granville Brothers. The Gee Bee was one of the Thirties' fastest planes – but it was cumbersome by modern standards. In this 3-D air game you must race against the competition, going under as well as over them – and bailing out when things get a bit tough! Steve Cartwright of *Hacker I*, *Hacker II* and *US Aliens* fame provides the code.

SEPTEMBER *CANCELLED*

Sadly Activision's ***September***, previewed last issue, won't be released after all (though it might appear on a compilation). But for the strategically minded there's still ***The Corporation*** to look forward to. In *The Corporation* it's the year 3026, and as commander of a robotic mining team you must prove your worth to one of the two all-powerful Corporations by finding the precious Minorthian crystal before your rivals do. The race is on in March for £7.99.

Fans of the hugely playable Data East coin-op ***Karnov*** will be pleased to see Electric Dreams's grand Spectrum version breaking new ground in Spectrum colour. You play a fire-breathing Russian battling through nine levels of angry dragons and killer biscuits to find the lost treasure of Babylon. The lost treasure and the biscuits are yours for £9.99 in March.

► *Supersprint* **follow-up: Activision's** *Championship Sprint*



Setting YET MORE new standards in graphics is Softek's **Ace** label. For £8.99 you can be the eponymous hero of ***Soldier Of Light***, defending another planet against enemy invasion. (What's wrong with Earth? Why won't anyone ever invade us?)

And then there's ***Alien Syndrome*** at £9.99, another arcade tie-in.

FRENCH MUSTERED

FRENCH software house **Loriciels** plans to do what Napoleon never could – conquer Britain. Since just last month, Paris-based Loriciels has been marketed in the UK by Elite under a long-term deal signed at the September 1987 *PCW* Show. And Loriciels expects to release up to 14 titles in Britain this year.

The first Spectrum release will be ***Super Ski***, a ski simulation scheduled for late spring.

There'll be games for IBM PC-compatibles and the Atari ST as well as 8-bit machines released under the Elite agreement, a 'long-term relationship' which replaces an earlier arrangement with Activision and which Elite expects to last at least two years.

Packaging and in-game text will be in English, and Loriciels is only releasing about a quarter of its French games here – because, says founder Laurent Weill, some of its adventures are too 'French-minded'. (For instance, one is based on a novel by 19th-century French writer Victor Hugo.)

Weill criticised Infogrames at Loriciels's official UK launch in the National Motorcycle Museum near Birmingham, saying the rival French house is 'releasing all the product they have in the UK even if it's French-minded'.

Besides games, the four-year-old Loriciels – which Elite boss Steve Wilcox describes as 'the major French entertainment-software house' – has produced a best-selling word processor, *Evolution*.

And its Microids division, which developed *Super Ski* and the successful 16-bit racing simulation *500cc Grand Prix*, also works on domestic robots.

UNBALANCED BUDGETS

AVAILABLE now from Mastertronic's £2.99 **M.A.D. X** label is ***Rockford***, with ***Rockman*** on the B-side – the last word in the ***Boulderdash*** genre.

Watch out for the distinctly unecological ***Spore*** on Mastertronic's **Bulldog** label. You use pesticide to put down the ever-multiplying spores, and when upsetting the balance of nature gets dull there's a screen editor for everlasting value.

And on the **Mastertronic** label itself is ***Panther***, in which you fly around the blue skies saving persecuted cities – a humanitarian conscience-sop after playing *Spore*, perhaps.

In March **Players**, which brought you *Joe Blade*, lets out ***Denizen***. It's taken author Paul Griffiths (*Riding The Rapids*) more than two years to finish and contains almost 100K of code. Contact has been lost with the plutonium reprocessing plant, and rumour has it that Jabba McGut is up to his old tricks again. It's up to you to jettison the contaminated areas into space . . . so send those pesticides with 'em.

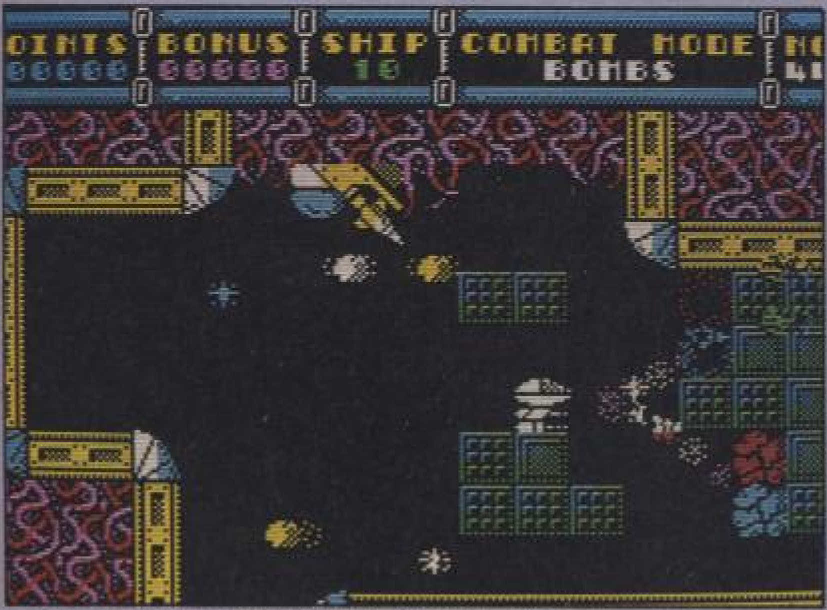
TAKING THE MOUSE

Gremlin Graphics's cartoon tie-in ***Mickey Mouse*** will surely be one of the most popular cartoon licences.

Mickey is staying in Disney Castle where four wicked witches have, under the influence of the Ogre King, stolen poor Merlin's magic wand. Using the wand the witches have cast a spell over the whole land and put everyone under the power of the Ogre King.

And, adding insult to injury, the witches have broken the wand in four. If Mickey can put it together again, after searching for the pieces in four monstrous towers guarded by ogres and wily witches, the spell will be lifted.

But if you think Gremlin's *Mickey Mouse* sounds macho, wait till you see **Hewson**'s ***Cybernoid – The Fighting Machine***, programmed by Raffaele Cecco (whose hits include *Exolon* and *Equinox*). It's very much in the *Zynaps* style – blast the backsides off all and sundry (all and sundry being pirates) and increase your fire power.



▶ **From the** *Exolon* **author: Hewson's** *Cybernoid – The Fighting Machine*

DRIVING AND SHOOTING

Despite middling reviews *Out Run* has proven a tremendous success story for **US Gold**, selling over 250,000 copies across all computer formats. Following closely in its tiretracks is ***Road Blasters***, an *Out Run* for aggressive drivers.

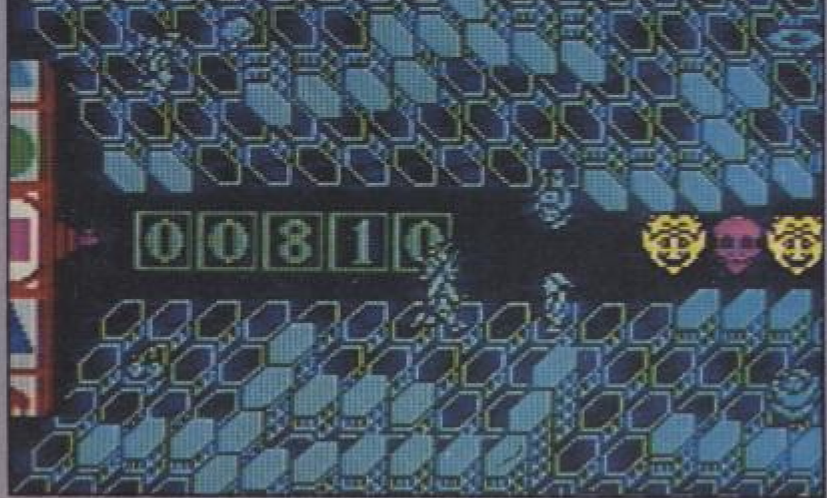
Back to shooting 'em up . . . **Martech** has the long-lasting Commodore 64 hit *Crazy Comets* coming for the Spectrum. Tremendously addictive simplicity is its strength.

From **Palace Software** and the authors of *Barbarian* comes ***Rimrunner***, described as a 'multiplane scrolling-landscape fast-and-furious shoot-'em-up'. It's written by Steve Brown (*Cauldron*, *Cauldron II* and *Barbarian*), and Richard Joseph (*Barbarian*) helps out with the sound. As an Insectoid warrior you must patrol the perimeter of a colony against the deadly Arachnoids, by the way.

Steve Brown is now turning his attention to ***Barbarian II*** – more violence, no doubt.

Palace is also launching a brand spanking new label next month – **Outlaw**. Its first release, ***Troll***, is described as 'pure arcade mayhem' – and looks like it could be precisely that, programmed by Spectrum veterans Denton Designs (*Double Take*, *Frankie Goes To Hollywood*, *Gift From The Gods*). Battling against a horde of goblins you must escape from the netherworld of Narc, using your own supply of escape holes to find the elusive exit.

▶ **'Pure arcade mayhem': Outlaw's** *Troll*

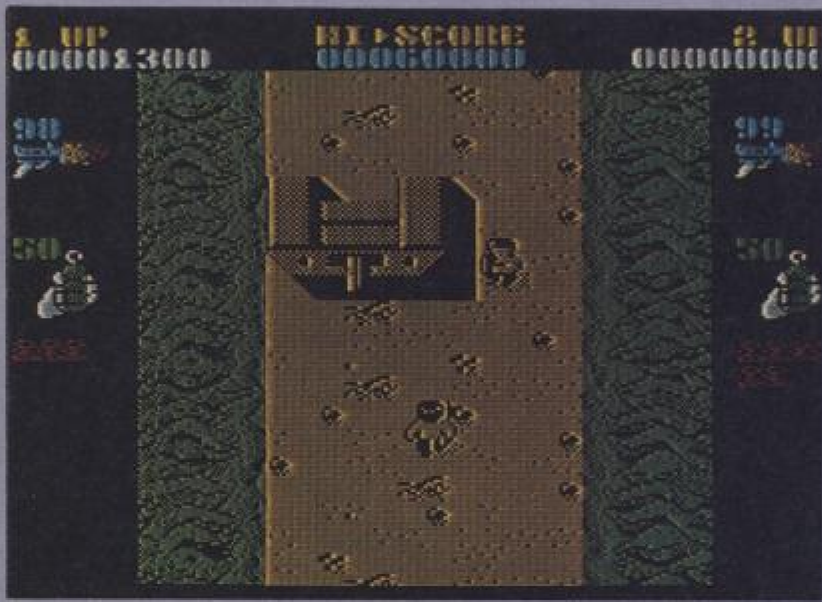


GRAFTGOLD/FIREBIRD FIRST

Steve Turner (*Pyracurse*, The Seidabb Trilogy, *Quazatron*), now a member of the Graftgold programming team, releases his first game under the new Telecomsoft/Graftgold deal next month.

On the Firebird label, it's the follow-up to Hewson's immensely popular *Quazatron* (94% in Issue 29). *Magnetron* brings KPL-2 back for another platform adventure on the space station Quarteck. By dismantling the enemy KPL-2 can boost his energy and fire power and eventually locate and shut down the main reactors of this metallic monstrosity.

▶ **Of course Ikaribout you still**

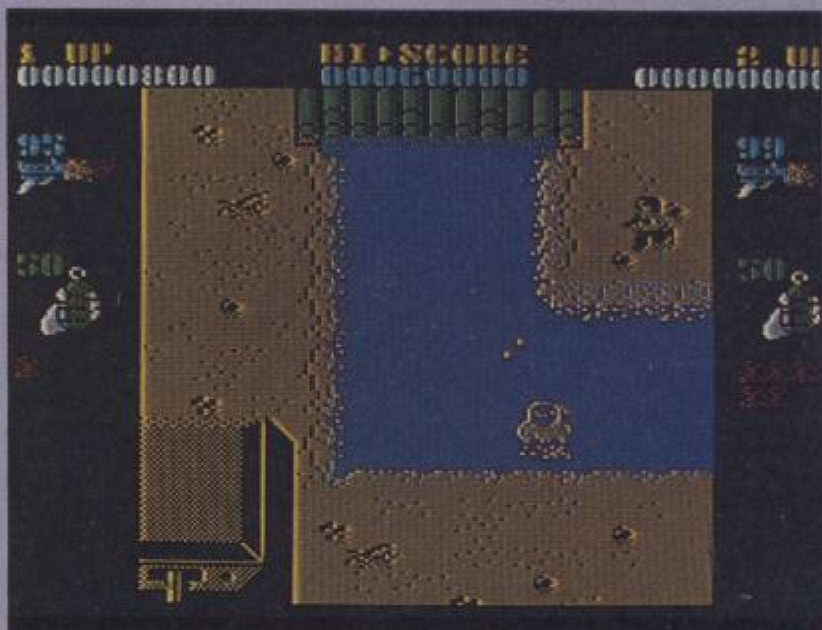


Tie-ins are coming from all directions at **Melbourne House** – though you'll have to wait a few months for them. First out should be ***Droids***, a licence of the popular children's TV show based on the adventures of *Star Wars* veterans R2-D2 and C3-PO.

Then there's the coin-op conversion ***Double Dragon*** and an American-football game endorsed by Denver Broncos quarterback John Elway, unimaginatively titled *Quarterback* – both should be out in early summer (if we get one).

Recently-launched **Destiny Software** is covering lots of different genres with its next few releases. In ***Seven Minutes To Midnight*** you must defuse a terrorist bomb in the centre of Moscow. ***Diamonds***, with a strong strategic element, sets you the task of building a spaceship. And for the adventurous there's ***King***, programmed by St Brides (*Jack The Ripper*).

It's mad, it's bad, and it's very late! **Elite**'s ***Ikari Warriors*** will finally reach the Spectrum in the next few weeks. One or two players trek through the jungle, swimming across swamps and blasting everything that moves, which obviously doesn't include Elite's programmers.



▶ **At last: Elite's** *Ikari Warriors*

Lastly, there's the follow-up to **Incentive**'s Smashed *Driller* – ***The Dark Side***, also using the innovative 3-D landscape-generation technique Freescape. More news soon . . .

Et Al

GOGGLE!

DOMINIC HANDY on video

BRATPACKER Rob Lowe is back on our screens this month in ***Square Dance*** (Sony, 15) Lowe plays a retarded young Southerner who meets a lady played by newcomer **Winona Ryder**. The emotions unfold as the two build a relationship against the wishes of her parents. *Square Dance* is a complete change for Lowe, and he performs admirably.

The fourth in the ***Superman*** series, subtitled ***The Quest For Peace*** (Warner, PG) is now out and the superhero/reporter is after the unsuspecting criminals again. Still carrying out good deeds, red-pants Reeve hurls all the remaining nuclear missiles into the sun – a good idea, you may think, but no. With all this energy Supe's old rival Lex Luthor creates Nuclear Man, a man who can melt iron and drill through buildings.

Has Superman met his match (again)? Will anyone notice that Metropolis is really Milton Keynes? Isn't Margot Kidder a bit old for all this now? Who cares?

We've had *Gremlins*, *Critters* and *Ghoulies* – and now we have ***Munchies*** (MGM/UA, PG). And the terrorising little blighters are in your local hire shop now.

Kelly McGillis, last seen flying high in *Top Gun*, is still up in the clouds in ***Made In Heaven*** (Guild Home Video, PG), starring with Timothy Hutton in a story of love that has no barriers.

Jeff Goldblum stars in David Cronenberg's ***The Fly*** (CBS/Fox, 18). The ads say 'Be afraid, be very afraid' – I saw it at the cinema and was absolutely scared out of my seat! If you miss this you'll be missing one of the greatest ever remakes (Kurt Neumann's version came out in 1958). Chris Walas (*House II*) and Stephen Dubius won Oscars for the terrifying makeup.

In ***Crimes Of The Heart*** (CBS/Fox, 15) **Jessica Lange**, **Diane Keaton** and **Sissy Spacek** star as three wild'n'wacky Southern sisters who get back together for a crazy, but fateful, reunion.

The big teen flick for the beginning of March is ***The Secret Of My Success*** (CIC Video, PG). Heart-throb Michael J Fox stars alongside Helen Slater in this very enjoyable romp about corporate life. Fox plays Brantley Foster, a small and insignificant member of a multinational company.

By reading the office memos and phoning a few people, using various fake identities, Brantley sets himself up with his own office, complete with nameplate . . . but his job is as a mail boy! And keeping his job going is only one of Foster's problems as he starts receiving advances from a junior executive (Slater) and his uncle's wife.

If you're heavily into deep dramas, look no further than ***'night Mother*** (CIC Video). It's the story of a young woman who is so set on ending her life that she prepares well in advance – but her mother finds out and tries to dissuade her.

It turns out that the young woman, played by the highly-regarded **Sissy Spacek**, suffers from epilepsy and has a failed marriage and a delinquent son. Life has been cruel to her so she might as well finish it as soon as possible . . .

Anne Bancroft plays the suffering mother, who also comes to believe that Jessie might just as well be dead. But she's got the guts to live or die – which will she choose?

Ex-bratpacker **Emilio Estevez**, currently being seen on the cinema screens with Richard Dreyfuss in *Stakeout*, wrote and directed ***Wisdom*** (Warner). He also stars, alongside **Demi Moore**, in this poorly-written *Bonnie And Clyde* partners-in-crime clone. It's only for real fans of the attractive couple (who nearly got married, till Bruce Willis jumped in and popped the question to Demi).

You may have seen cult comedian **Pee Wee Herman** (Paul Ruebens in real life) making a few TV appearances in the UK last year – but apart from that he's been unknown this side of the Atlantic. Now this stick-like character who revels in acting like a helium-breathing hyperactive 5-year-old is in a film of his own.

Aptly named ***Pee Wee's Big Adventure*** (Warner, U) it's a very childish excuse to string together a few good gags and make a feature-length movie out of them. Not surprisingly, it fails dismally, and the soundtrack (by Danny Elfman) is the only saving grace.

On an even lighter note, CIC's March 18 release gets my award for Title Of The Month – ***Amazon Women On The Moon***! Of course it's a parody of those (in)famously tacky SF flicks of the Fifties. And it has a star-studded credit list: **Joe Dante** (*Gremlins*, *Innerspace*) and **John Landis** (*Trading Places*, *The Blues Brothers*) are directing, and the stars include such favourites as **Carrie Fisher** (*Star Wars*), **Rosanna Arquette** (*Desperately Seeking Susan*, *After Hours*), **Steve Forrest** (*Spies Like Us*), **Michelle Pfeiffer** (*Ladyhawke* and *The Witches Of Eastwick*) and **Sybil Danning** (*Diner*)!

Several superbly-written short stories are cleverly, and successfully, joined together to make *Amazon Women On The Moon* (shades of the *Leather Goddesses Of Phobos* game?) one of the most interesting releases of the month.

The Big Easy (RCA/Columbia, 15) stars Dennis Quaid (*Innerspace*) and Ellen Barkin. When tough cop McSwain (Quaid) is framed for accepting protection money the Assistant District Attorney (Barkin) tries to get him cleared. Quaid and Barkin make a perfect awkward screen couple – they both love the other but don't want the other to find out!

Then comes ***La Bamba*** (RCA/Columbia, 15). the story of rock star Richie Valens, who was tragically killed in the same plane crash that took the lives of Buddy Holly and Big Booper. Newcomer **Lou Diamond Phillips** plays the young Mexican fruit-picker with dreams of becoming a rock singer and nightmares of an airplane crash – and both come true.



► **Any evening you like:** *The Living Daylights* **comes soon**

The main drawing point of the film is, undoubtedly, the soundtrack: the title song and album went to Number One in the UK charts last autumn.

Alan Parker's latest, ***Angel Heart*** (Guild Home Video, 18), arrives in late March starring **Robert De Niro** (*The Godfather*, *The Deer Hunter*, *The Untouchables*, everything else) and the bestubbled **Mickey Rourke** (*9½ Weeks*). Desperate private investigator Harry Angel (Rourke) will do anything for a quick buck, so when the mysterious Louis Cyphre (De Niro) offers him a contract for $125 a day he can hardly refuse. After all, he's only got to find a big-band singer – no problem.

But the problems start when Angel unravels Johnny Favorite's sordid past. Harry wants out, but Cyphre just raises the payments.

The Living Daylights (Warner, PG) is the latest James Bond film and one of the best. Timothy Dalton takes the role of the suave secret agent for the first time, and Maryam d'Abo temps is the latest Bond Girl. And the new-look Bond movie – set in a recognisably modern world, not the vague Cold War Fifties/Sixties of the earlier films – even has a young new actress playing the secretary Moneypenny.

But the boffin Q is still there, giving new meaning to the term 'ghetto blaster'. And you still get the same old action-packed suspense-filled couple of hours.

Much further into the future, there's ***Jaws The Revenge*** (CIC Video). The story line lacks a certain bite – as do all the sequels to the terrifying first *Jaws* film – and the rather fin fish tale simply doesn't wash. It's just kept above water (sorry) by performances from **Michael Caine**, **Lorraine Gray** and **Mario Van Peebles**.



PHOTO: *The Mission*/Warner Brothers

WIN £50 OF SOFTWARE!

If you're one of the 50% who read magazines from back to front, you won't know yet that because it's CRASH's 50th issue we're offering prizes increased to £50! They're in four sections: Playing Tips, On The Screen, Robin Candy's Scores and the charts.

And here's another chance to win £50 worth of software. Just write the cleverest computer-related caption you can for the photo above and send it (the caption) in on a postcard or the back of a sealed envelope.

The address is GOLDEN CAPTION COMP, CRASH, *PO Box 10, Ludlow, Shropshire SY8 1DB* and the deadline is April 5 and the decision of CRASH's appointed judges is final in all respects and the winning caption will be published and entries shouldn't be this long!

To be eligible for all the increased prizes on offer this month send us your tips, maps, screens, scores and chart votes (using the forms on this page) as soon as you can. The winners will be in the next CRASH, on sale March 31. (Of course, if you miss the £50 prize deadline you'll still be eligible for the usual prizes in following issues.)

Have you . . .

Ever thought of writing for CRASH?

If you haven't, don't bother reading on. Working on **CRASH** involves much more than playing games, and we're looking for someone committed to writing to become a **Staff Writer** here.

The job consists largely of writing critical comments on games, and will also include writing some intros (the long, descriptive parts of each review) and features. Some general office administration is involved, as is occasional travel within England.

The position is full-time and based in Ludlow; it will carry a small salary at first and a decent professional salary when you're a decent professional.

The successful applicant, committed to learning the skills of publishing, will be a games-player who offers English as good as his/her high scores and can work as hard at proofreading as at BMX racing. An interest in adventures would be useful, but **CRASH** staff have to work on all sections of the magazine.

To be considered you MUST be available by the end of March, and be over 16 – we have to obey the employment laws like anyone else. Ideally you'll have passed your 18th birthday too.

Some experience in publishing (working seriously on a fanzine or a school magazine, for instance) would be helpful but it's certainly not essential. We really want to hear about your age, qualifications, interests, previous employment and school work-experience courses. Tell us what newspapers and magazines you read regularly, too.

And we'd like the names and addresses of two referees (not relatives or family friends – perhaps a teacher and someone you've worked for in a summer job?).

There's more. To prove your writing ability, send us an intro and a criticism of a recent game, covering the points that **CRASH** usually does. Try to stick to straightforward, clear writing – bright, quick jacks of many trades, rather than literary pundits, are what we need.

And as your final test we'd like you to tell us the name of the current MP for Chipping Barnet and his/her party, a telephone number of Foregate Street railway station in Worcester, and the population of Marseilles, France (note your source).

Send your application as soon as possible to: The Editor, **CRASH**, *PO Box 10, Ludlow, Shropshire SY8 1DB*. Please don't telephone. All applications will be acknowledged on receipt and some candidates will be contacted later for expenses-paid interviews.

VOTE FOR THE CHARTS

HOW TO VOTE FOR YOUR FAVOURITE GAMES: give each of your top five games for the HOTLINE, ADVENTURE and STRATEGY charts a mark out of ten – the better the game, the higher the mark.

ADVENTURE CHART

TITLE **MARK OUT OF TEN**

1 ....
2 ....
3 ....
4 ....
5 ....

Name ....
Address ....
....
.... Postcode ....

T-shirt size ☐
This is the £40 of software I'd like if I win first prize, but I know some games are unavailable and CRASH can't promise anything ....
....
....

Send this voting form to: **CRASH ADVENTURE CHART, *PO Box 10, Ludlow, Shropshire SY8 1DB***

HOTLINE CHART

TITLE **MARK OUT OF TEN**

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Send this voting form to: **CRASH HOTLINE CHART, *PO Box 10, Ludlow, Shropshire SY8 1DB***

STRATEGY CHART

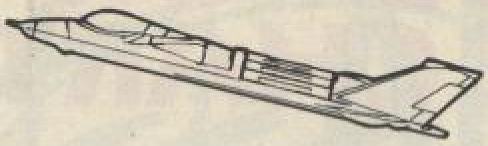
TITLE **MARK OUT OF TEN**

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COMPETITION

FLY AWAY WITH A PERSONAL STEREO FROM

DIGITAL INTEGRATION

DIGITAL INTEGRATION'S *ATF*, reviewed on page 17, is much more than a shoot-'em-up. The fantastic flying game requires quick thinking as well as a trusty trigger finger. And to get through this CRASH/Digital Integration competition you'll need much more than luck.

Five top winners will each receive a personal stereo and a copy of *ATF*, **five second-prizewinners** will each receive a limited-edition *ATF* sweatshirt and a copy of the game, and **20 runners-up** will each receive a copy of the game.

Just answer these six multiple-choice questions on Digital Integration's history, products and progress. (Those with every issue of CRASH will find them no problem!) There's no need to cut out this page – just write the question numbers and answer letters on a postcard or the back of a sealed envelope, and don't forget your name and address too.

Entries should be dispatched by the quickest fighter plane possible to **DIGITAL INTEGRATION COMP, CRASH, *PO Box 10, Ludlow, Shropshire SY8 1DB*** to arrive by **April 5**. The decision of CRASH's appointed judges is final in all respects – so get flying!

1 Which Digital Integration game puts you behind the wheels of public transport?
a) *Bus Stop!*
b) *Hire Car*
c) *Taxi!*

2 How much did the Spectrum version of Digital Integration's Fighter Pilot **cost when it was first released?**
a) £1.99
b) £7.95
c) £9.99

3 What accolade did CRASH give Digital Integration's Night Gunner?
a) Game Of The Month
b) A CRASH Smash
c) A CRASH Classic

4 Who programmed Digital Integration's Tomahawk?
a) D K Marshall
b) R J Swift
c) J M Saville

5 Which Digital Integration game did Nick Phipps help design?
a) *Sleigh Bell*
b) *Top Dog*
c) *Bobsleigh*

8 What antipiracy device was introduced by Digital Integration in Tomahawk?
a) Lenslok
b) Code Sheet
c) Bed Sheet


JUST THINK
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TRANTOR THE LAST STORM TROOPER
Screen shots from Spectrum version.
Trantor™ was called from out of the ranks of the warrior forces, as leader of a band of outlaw mercenaries, whose mission is to smash the growing power of New World NEBULITHONE.
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SPECTRUM £8.99, SPECTRUM +3 £12.99 Disk
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When New Texas screamed for an army of men, Earth sent one man – he was enough – he was BraveStarr™
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SPECTRUM £8.99
Screen shots from Amstrad version.
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